

Full Throttle

Pushing The Envelope Of Flight Simulation!

October/November 1998

Volume 5 Number 5

USA \$7.95

**Big Jet
Fuel Management**

**Virtual
Flight Training**

REVIEWS

- DC-3
- Super Flight Planner
- Aircraft 98 Collection
- Europe 3
- Chicago O'Hare International Airport

Oshkosh '98

**Snake Bit:
Riding In An F-16 Viper**



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ON THIS,
FLYBOY.

Microsoft

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international



BOMBARDIER BUSINESS AIRCRAFT

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Look here ace, you've got just 90 feet of runway before you earn your wings the hard way. Face it. Your fixed-wing rules do not apply here. What you need is a helicopter.



And now you've got one in Microsoft Flight Simulator 98, an upgrade guaranteed to blow all past flying experiences out of the sky. With it you'll soar over vastly improved landscapes that include 3000 airports (10 times more than the previous version) and more than 45 cities around the world.

Flight Simulator 98 features multiplayer, force feedback support and flight models validated by Cessna and Learjet,



so you can achieve all new levels of flight realism. Take control of the widest range of aircraft, including this Bell 206B JetRanger III helicopter, a machine that's guaranteed to make you feel like a rookie all over again.



Your coordinates for take-off are www.microsoft.com/games/fsim

Full Throttle

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Pilot's Note: This information is not intended for use in actual flying situations. While the information is as realistic as possible, you should not use it for actual flying instruction. *Safe flying!*

Dear Flight Simulator Enthusiast,



In case you haven't noticed, it's been a busy year for all of flight simmers. You'll also notice that the next few months promises to be even busier. Just look at the list of new flight simulators that will be soon arriving:

- ➔ Interactive Magic Warbirds Online – October
- ➔ MicroProse Falcon 4.0
- ➔ Nomissoft Airline Simulator Pro – October
- ➔ Sierra/Dynamix Pro Pilot 99 – October
- ➔ Sierra/Dynamix Red Baron 3D – October
- ➔ Electronic Arts Jane's Fighter Legends – November
- ➔ Interactive Magic Dawn of Aces Online – November
- ➔ Microsoft Combat Flight Simulator – November
- ➔ Terminal Reality Fly! – late 1998

With this many new sims, we have an even larger choice to suit our preferences. Stayed tuned and we'll have reviews of these as they become available.

From your very vocal feedback, the majority of you **absolutely** like our New Product section. Each month we receive dozens of Press Releases and review copies from publishers of flight sim add-ons and makers of flight sim accessories. Our staff has routinely prepares product announcements and conference reports for you to read. We want to help you decide how you might want to invest your funds into new software and hardware items.

You've also told us that Product Reviews are important to you. When a software publisher or accessory maker sends us a review copy or sample, we try to find a suitable reviewer to put that product through its paces. We'll continue to review a wide range of flight sim products — on a timely basis. And because you've asked to see reviews of more accessories — flight yokes, joysticks, consoles and the like — we'll be expanding our reviews here too.

Judging from the number of new products coming in the next few months, it's safe to say that we'll have an interesting time ahead. Hopefully, it will be a fun time too.

Happy Flying,

Arnie Lee

Publisher

Contents for October-November 1998



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Information and news on recent and upcoming software and hardware.

Snake Bit: My Ride In An F-16 Viper 16

You may remember the article on Major Jeff (Jethro) Traver and his experiences flying the F-16 in the April/May 1998 of *Full Throttle*. However, this time asked our Jim Rhoads to explain what's it like to be a passenger in one of the world's premier fighter jets. Read about his experience and why he could sum this whole story up in one word: YEEHAW!!!!

Big Jet Fuel Management In MS Flight Simulator 24

Fuel management looks like a simple and mundane task. However, except for the physical state of the aircraft itself, fuel is the most important factor in powered flight. In real aviation, fuel management is one of the primary concerns of the pilot of any aircraft from Cessna to Concorde. Yet many Flight Simulator pilots pay little or no attention to it. Read how and why fuel management is important in your FS experiences.

EAA Airventure Oshkosh 35

It's estimated that 10% of all the aircraft on the planet will be found at Oshkosh during the EAA Airventure Oshkosh. You'll see ultralights to the latest experimental aircraft, vendors pushing new products and all the big names in aviation (like Patty Wagstaff shown here). Find out what makes the EAA Airventure Oshkosh the place to be.

Round Robin Adventure #3 44

This month take a trip in the Northeast from New York to Maryland to Pennsylvania and back to New York.

How I Make Scenery: Natural Geographic Features....49

Justin Tyme continues his series on making your own scenery. Natural geographic features can greatly improve the realism of how you enjoy your simulation experience. In this installment he'll show you how to make lakes, rivers and streams.

Virtual Flight Training: Point to Point Navigation 53

This column looks at the development of navigation and flight planning, from the earliest days of biplanes with road maps in the cockpit to the latest jet airways. In this issue, we'll look at ADF and wind drift, flying away from an NDB and flying at night.

The MicroWings Conference 57

MicroWings is officially known as *The International Association for Aerospace Simulations*. But organizer and president Robert Mackay likes to refer to the MicroWings Conference as "flight sim heaven." You'll find out why in this article.

Feature Review: Pro Flight 98 61

If you've been looking for an easy-to-use program to generate realistic ATC adventures using a wide variety of realistic .WAV files, read why you should consider **ProFlight 98** from AETI.

Product Reviews 66

In this issue we'll look at **Super Flight Planner**, **HQ Aircraft Collection 98**, **DC-3**, **Scenery Vienna** and **Europe 3 Scenery**.

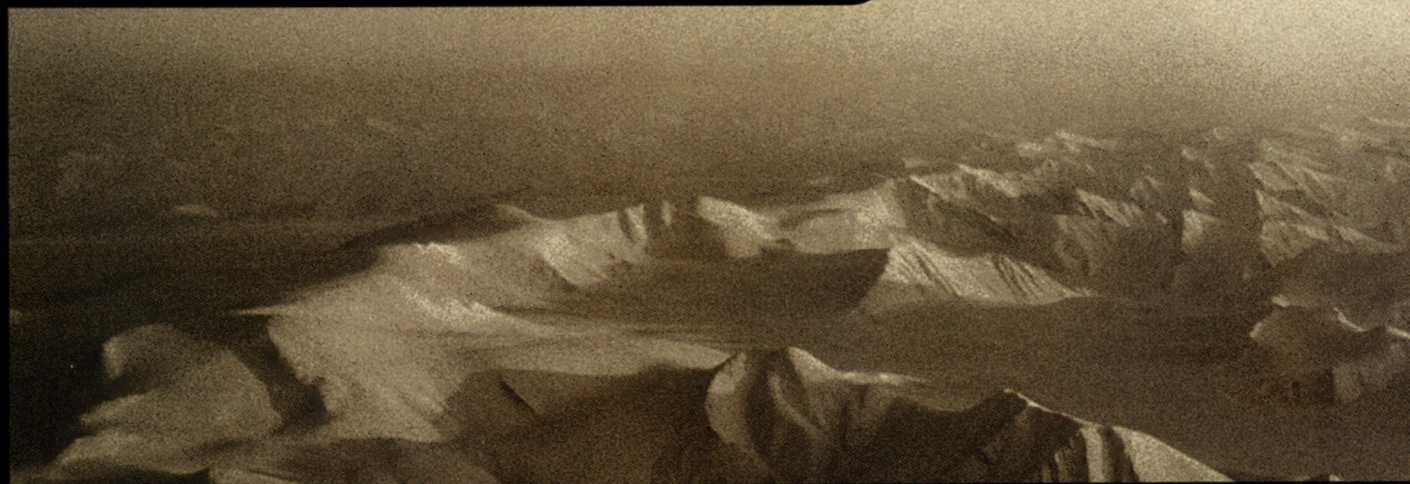
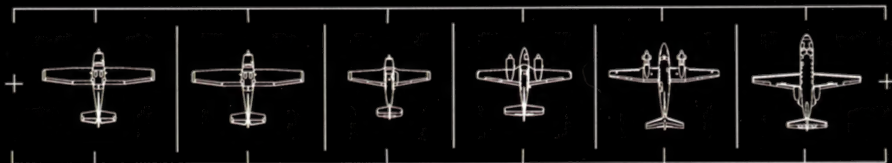
Web Watch 78

Adam Howe presents this issue's picks of the great flight sim web sites.



Cover Photo

Special thanks to Eric Hehs of Code One Magazine for the F-16 photo material.



O N C E Y O U G O U P , Y O U



○ 3D SUPPORT INCLUDING
ATMOSPHERIC EFFECTS

○ NAV AIDS INCLUDING:
ILS, NDB'S AND VOR'S

○ POP-UP OPERATORS
HANDBOOK

○ GLOBAL POSITIONING
SYSTEM

○ FLY SIX OF THE WORLD'S
MOST POPULAR AIRCRAFT

○ AUDIO AIR TRAFFIC
CONTROL

○ U.S., WESTERN EUROPE
AND CANADA SCENERY

○ ENHANCED FLIGHT
PLANNING WIZARD

○ 38 MILLION ACTUAL
ELEVATION POINTS

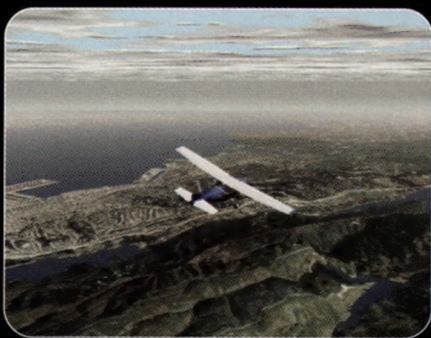
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○ OVER 3,500 AIRPORTS/
35 METROPOLITAN AREAS

○ 30 FLIGHT MANEUVER
VIDEOS



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www.propilot99.com

Dynamix
A SIERRA COMPANY



NOTAMs: New Products

For those of you who aren't familiar with the term, NOTAMs is an acronym for NOTices to AirMen. The U.S. Government issues NOTAMs regularly. This issue of Full Throttle includes our version of NOTAMS — an expanded new products section. It's a regular part of our magazine. The products listed are compiled from press releases and information provided by the respective authors and companies who supply the products. We've taken steps to verify the information with each author or company, but cannot be responsible for inaccurate features, specification or availability dates.

Pro Pilot 99 Sierra Readies New Sim

Based on feedback from the release of last year's Pro Pilot, Sierra has announced that a new version with a '99 moniker will be ready to fly in October. The new **Pro Pilot 99** features 3-D graphic acceleration, visually enhanced gauges and instruments, glowing runway lights, cloud layering, weather selection and improved instrument flight.

Pro Pilot 99's 3-D terrain representation is based on 38+ million elevation points. Scenery includes highways, rivers and landmarks, 35 major metropolitan areas and 3,500 airports, making it possible to fly virtually anywhere.

Mark Pechnick, **Pro Pilot 99** chief designer, characterizes Sierra's new simulator as a realistic and accurate way to learn to fly. To this end, Sierra has teamed up with the National Association of Flight Instructors to develop 48 online tutorials that teach flying skills. In addition, Sierra is working with the Experimental Aviation Association to reach the hundreds of thousands of pilot "wannabes."

Pro Pilot 99 also includes audio air traffic control commands and features six aircraft: Cessna 172R, Cessna 172P, Beechcraft Bonanza V35, Beechcraft Baron B58, Beechcraft King Air B200 twin and Cessna CitationJet 525.



Pro Pilot 99
For Windows
95

Sierra On-Line, Inc.
3380 146th Place, SE
Bellevue, WA 98007
Phone: (800) 757-7707
Fax: (425) 644-7697
Internet: <http://www.sierra.com>
SRP: \$49.95

X-Plane Expansion Set Simulator Grows "Wings"

Belgian publisher Wilco has announced a new add-on package called **X-Pansion** for Austin Meyer's X-Plane Simulator. The X-Plane simulator runs on either Pentium PCs or the Power Mac.

X-Pansion adds new scenery to X-Plane that covers the US and Europe and contains airports, cities and mountains. Highly detailed European areas include Belgium, France, Germany, Greece, Italy and Luxembourg.



An expanded X-Plane compatible database has over 7,000 airports, 16,000 Nav aids and 22,000 intersections covering the world.



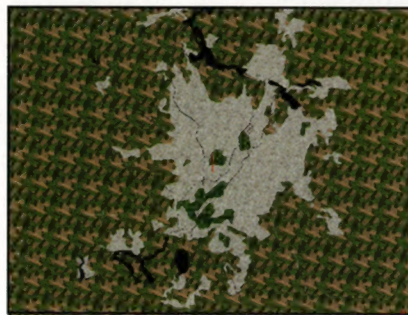
X-Pansion also includes brand new aircraft: Boeing 737, 747, 767, Airbus A-310, McDonald Douglas MD-80 and MD-11, ATR-42, King Air 200 and Cessna Citation.

**X-Pansion
For X-Plane
Simulator**

Wilco
Chaussee de Ruisbroek 290
B-1620 Drogenbos, Belgium
Phone: + 32-2-331-3290
Fax: + 32-2-331-0751
Internet: <http://www.wilcopub.com>
SRP: \$42.00

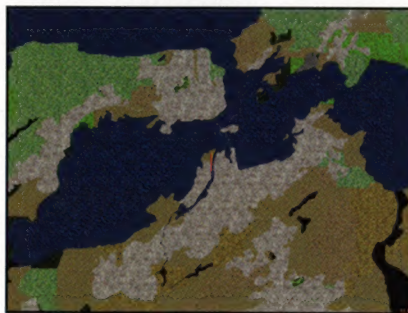
FS Global Upgrade Replacement for Default Scenery

Pilot's, based in Vienna, Austria, is preparing to roll out **FS Global Upgrade**. According to Managing Director Stefan Schaefer, **FS Global Upgrade** is designed to improve the accuracy and visual appearance of Microsoft Flight Simulator's default scenery. "The default scenery has many areas which are inaccurate. This makes VFR flying difficult or even impossible. We use digital data to recreate the base (default) scenery much more accurately than the standard default Microsoft scenery," says Schaefer.



In addition to the digital data, **FS Global Upgrade** also uses completely new textures. Other features include:

- Detailed coastline, islands, cities and towns
- Major highways and roads
- Detailed vegetation, railroads and pipelines
- Mountains implemented as synthetic tiles
- Worldwide enroute navigation aids based on real-world B-747 instrumentation data



**FS Global
Upgrade
For Microsoft
FS5.1, FS95
and FS98**

Pilot's
Wiplingerstr. 24-26
A-1010 Vienna, Austria
Phone: + 43-1-535-4010
Fax: + 43-1-535-4010
Internet: <http://www.austrodata.at/GBS>
SRP: \$49.95



by TERMINAL REALITY INC.

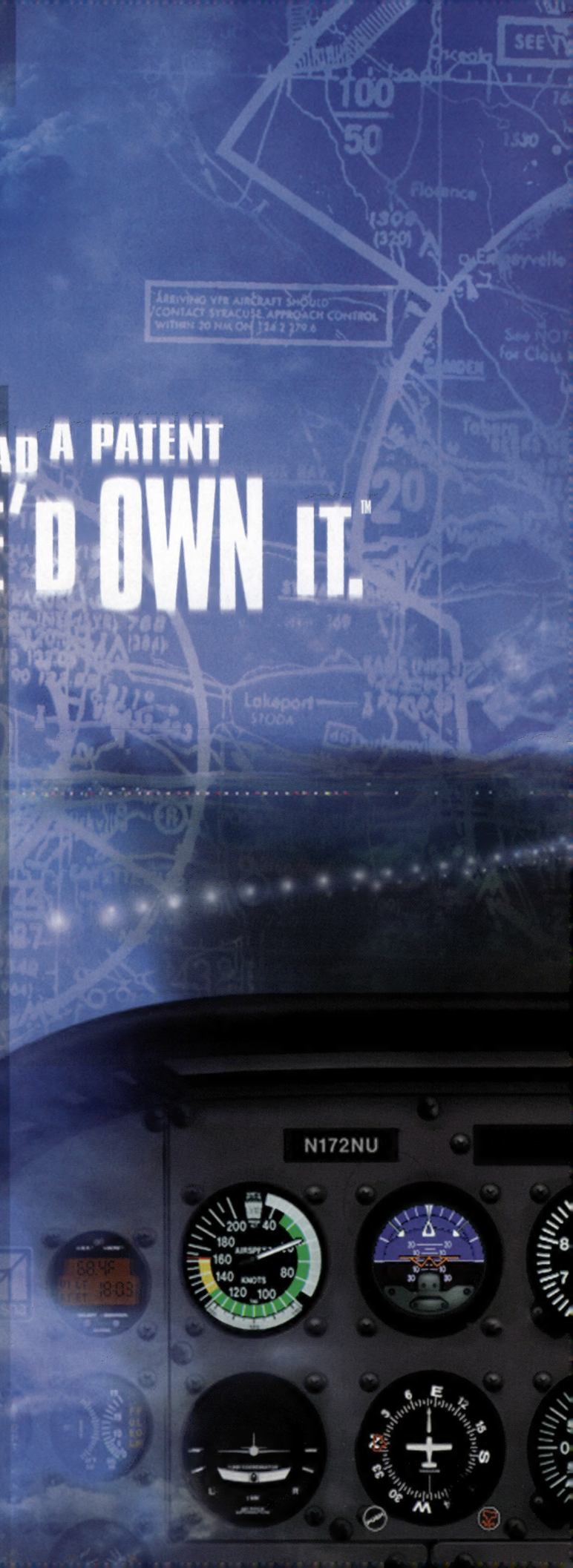
IF REALITY HAD A PATENT WE'D OWN IT.™

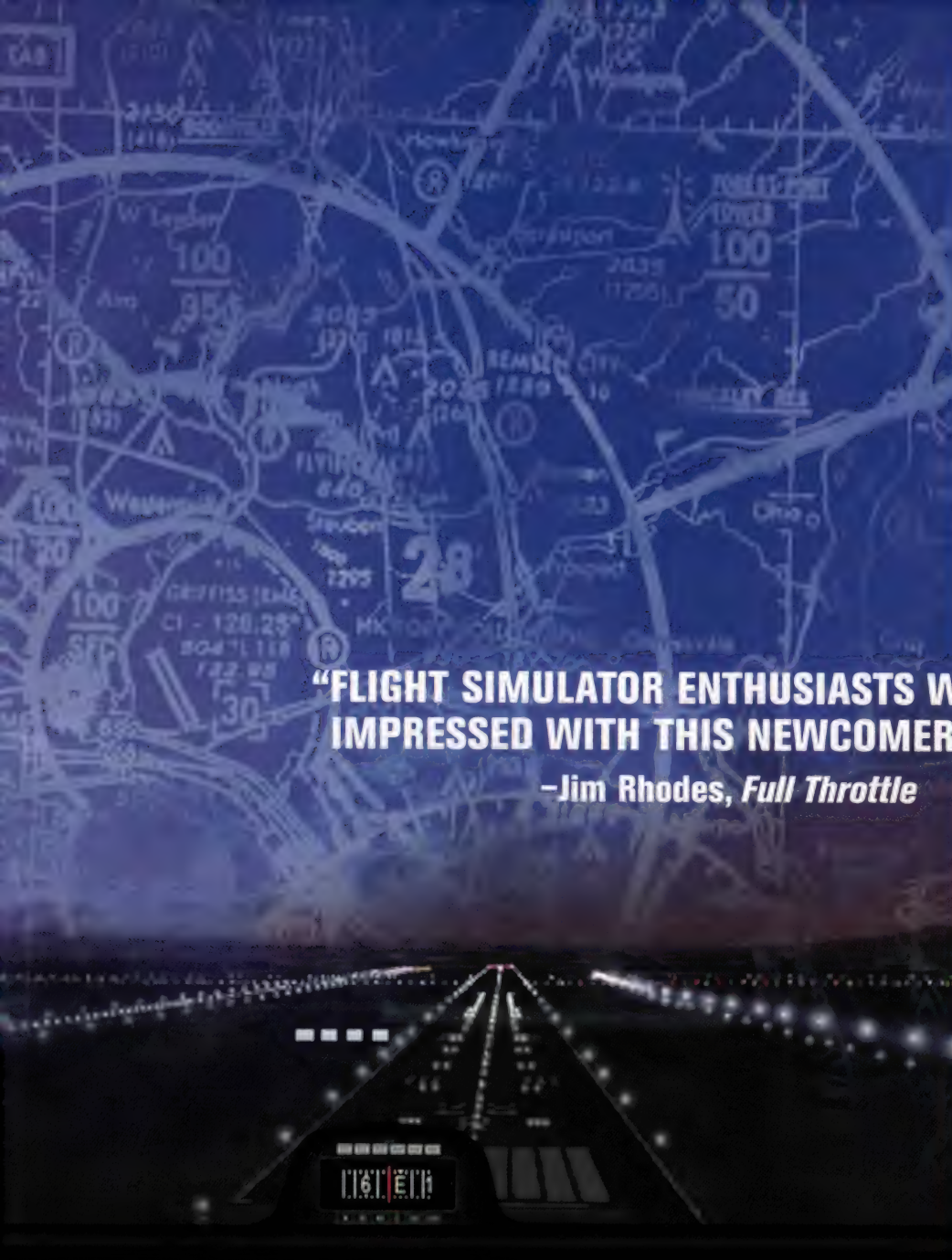
More than 9,000 airports and 30,000 nav aids covering over 200 countries, territories, and islands. • Five accurate aircraft models (including single prop, dual prop, turboprop, and business jet) based on specifications and performance data from actual aircraft manufacturers. • Accurate aircraft cockpits and avionics, all in the correct proportions and layout from original aircraft. • Terrain system and global digital elevation model allow for realistic flight all over the world. • Fly at any time of day or year, in a variety of user-defined weather conditions, or by importing NOAA METAR weather reports. • Realistic voice air traffic control (ATC) interacts with you for ground control, tower, approach, departure, and regional center operations. • Designed for expandability. Look for future aircraft and scenery expansion packs, as well as end-user editing tools. • Five scenery areas with continuous satellite imagery, covering 50,000 square miles of area. • Integrated flight planner and aircraft load-out, allowing visual planning of cross-country flights and user-defined fuel, passenger, and cargo loads. • Native 3D hardware support for Microsoft Direct 3D, 3Dfx Glide, Rendition Redline, NEC PowerVR, and Apple RAVE. • Join up to 7 friends in an Internet flight party, with text and full voice chat support.



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"FLIGHT SIMULATOR ENTHUSIASTS WILL BE IMPRESSED WITH THIS NEWCOMER, FLY!"

-Jim Rhodes, *Full Throttle*



Actual cockpit and runway screenshot

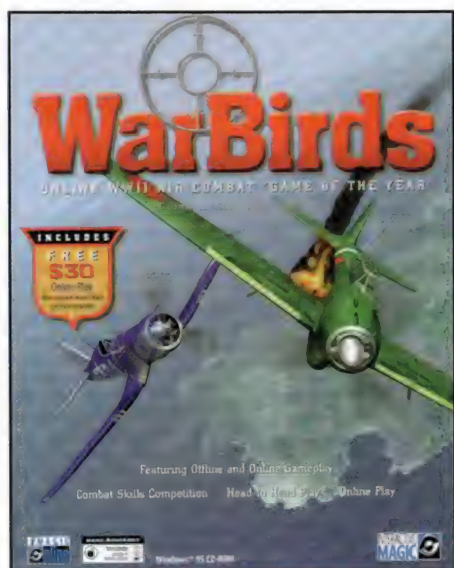
TRI
TERMINAL REALITY INC.
www.iflytri.com

GATHERING
DEVELOPER
www.godgames.com

WarBirds

New version for Internet Gaming

Interactive Magic has recently released **WarBirds V2.0**, one of the most widely used online gaming simulators. **WarBirds** users connect to one of three nightly arenas hosted by iMagic's Online Internet Gaming Service. An arena represents a geographical combat area from World War II.



This version has a set of brand new features, starting with an easy-to-use, point-and-click interface. iMagic's "MEGAVoice" technology lets players talk over the Internet while gaming. Also new is the 3-D graphics acceleration that provides for effects such as sun glare, barrel flashes and explosions.

iMagic has enhanced the flight and damage modeling and added new World War II aircraft: Messerschmidt ME 109, ME 110, the Hurricane and an early model Spitfire. New terrain sets add to the variety of scenery.

For the first time, the package includes a printed flyer's guide. The price of **WarBird 2.0** includes \$30 worth of online gaming time.

WarBirds Version 2.0 For Windows 95 or 98	InterActive Magic P.O. Box 13491 Research Triangle, NC 27709 Phone: (919) 461-0722 Internet: http://www.imagicgames.com SRP: \$29.95
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DC-10 Aircraft Set

FlightSoft's "Tribute" Collection

Newcomer FlightSoft of Belmont, Massachusetts has released "Tribute to the DC-10." This new add-on for Microsoft Flight Simulator 98 is a collection of twenty-four different models of the classic DC-10 aircraft, with designs from the major airlines.

The DC-10 aircraft include new, advanced cockpits with custom instrumentation for easy navigation and flight. With 68 MB of new .WAV files, this package features real DC-10 sounds and actual air traffic control communications.



In addition to the operating manuals and in-flight checklists, "Tribute" also includes four adventures, including Los Angeles LAX to Honolulu, live videos of DC-10 landings and flight sim videos.

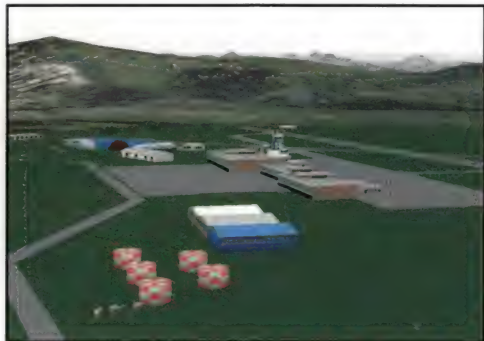


Tribute to the DC-10 For Microsoft FS-98	Flight Soft 26 Common St Suite 246 Belmont, MA 02478 Internet: http://www.flightsoft.com SRP: \$34.95
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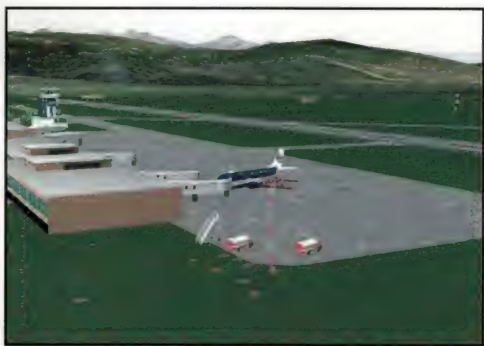


The Himalayas Lago's Latest

Flight sim add-on publisher Lago says that their new **Himalaya Scenery** is the largest scenery ever made for Flight Simulator. The scenery ranges more than 2.5 million square kilometers (about one million square miles). It encompasses parts of Burma, Bhutan, China, India, Nepal and Pakistan, including 34 airports in Nepal.



According to Managing Director Ugo Grandolini, the developers at Lago use real terrain techniques to build the **Himalaya Scenery** and to achieve a resolution of 18 meters per pixel.



**Himalaya
Scenery
For Microsoft
FS98**

Lago snc.
Via Garibaldi 30
I-22100 Como, Italy
Phone: + 39-31-241-444
Fax: + 39-31-265-999
Internet: <http://www.lagoonline.com>
SRP: \$34.95

Red Baron 3-D New Version of Sierra's WWI Classic

Sierra says that the newest version of its well-known Red Baron World War I combat simulator is due out in October. From its name, you can guess that the new version features accelerated 3-D graphics. To this, Sierra had added multiplayer mode through the World Opponent Network (WON.net). All Internet play is free of charge.



Red Baron 3-D's 40 new planes are said to follow exact specifications of the originals including weight, wingspan, power, etc. The dynamic mission generator assigns cyberpilots random missions that simulate actual World War I aerial battles.

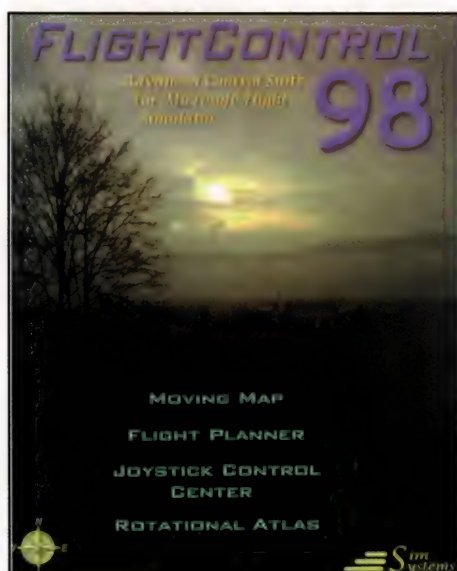
Red Baron II flyers can upgrade to **Red Baron 3-D** by downloading the patch from Sierra's web site at www.redbaron3d.com/downloads.html.

**Red Baron 3-D
For Windows
95**

Sierra On-Line, Inc.
3380 146th Place, SE
Bellevue, WA 98007
Phone: (800) 757-7707
Fax: (425) 644-7697
Internet: <http://www.sierra.com>
SRP: \$39.99

Flight Control 98 Cockpit Add-on for Microsoft FS98

Sim Systems of Queensland, Australia has announced a new add-on package. **Flight Control 98** is a set of tools for enhanced flight navigation using Microsoft Flight Simulator 98.



Flight Control 98's moving map displays airports, runways and nav aids on a single screen. These appear with background maps and relevant flight data, keeping the pilot informed of the aircraft's exact position. The moving maps link to the aircraft's autopilot instrument.

The package also includes a flight planner for any area in the world, including long-distance, trans-oceanic flights, and works with any add-on scenery. The completed flight plan can be used by the moving map.

A joystick control center lets you customize a joystick, flight yoke or throttle device. This feature lets you add "virtual" buttons to perform common and repetitive flight sim commands and procedures.

Flight Control 98 For Microsoft Flight Simulator 98	Sim Systems Pty Ltd. P.O. Box 77 Cleveland, QLD 4163 Australia Fax: +61-7-3822-6112 Internet: http://www.simsystems.com.au SRP: \$45.00
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Dawn of Aces iMagic's New Online Entry

For the past two years, WarBirds has been named Online Game of the Year by *PC Games Magazine*. Based on this success, Interactive Magic is introducing **Dawn of Aces**, which provides a World War I setting for online combat.

Spokesperson Lee Cantrell has suggested that **Dawn of Aces** is a little less intense than WarBirds and may be more appropriate for gamers who are just starting out in online play. According to Cantrell: "World War I aircraft were slower flying, so the pace of the combat is more tolerable for beginners."



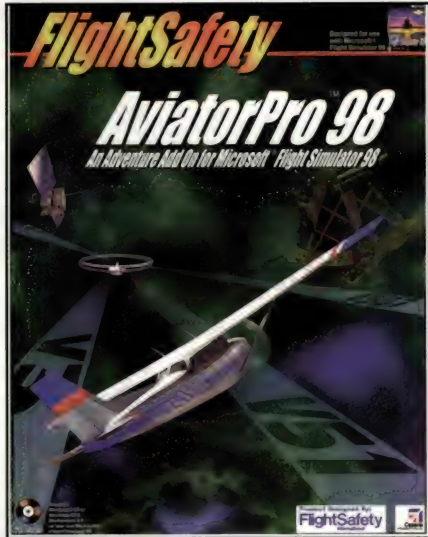
Players will choose from this initial set of aircraft: Bristol F.2B (Great Britain), Sopwith Camel (Great Britain), Spad S.VII (France), Fokker Dr. 1 (Germany), Albatros D.Va (Germany) and Halberstadt Cl II (Germany). They'll fly in "arenas" (geographical areas) that allow up to 300 pilots to go head-to-head in the air battles and talk to each other using iMagic's MEGAVoice technology.

The scenery is based on France, and pilots can fly for either the Allies or the Central Powers. Beginners can ask for coaching from the dedicated trainers. **Dawn of Aces** is now in a beta stage and is free to download from iMagic's Web site.

Dawn of Aces For Windows 95 or 98	InterActive Magic P.O. Box 13491 Research Triangle, NC 27709 Phone: (919) 461-0722 Internet: http://www.imagicgames.com SRP: \$29.95
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AviatorPro 98 IFR Adventures

FlightSafety International has announced **AviatorPro 98**, a series of challenging adventures especially for IFR flight using Microsoft Flight Simulator 98. The goal of this add-on is to challenge your instrument flight skills.



AviatorPro 98 has five complete adventures. These adventures randomly add system malfunction and severe weather changes. **AviatorPro 98** tracks your flying performance along the way. You can later review your score.



Five complete IFR adventures take you from Boston to Martha's Vineyard, Massachusetts; Vero Beach to Orlando, Florida; Seattle to Yakima, Washington; Grand Junction to Gunnison, Colorado; San Jose to Salinas, California. **Aviator Pro 98** can be downloaded over the Internet or purchased in a boxed version.

FlightSafety International is the world's leading professional flight training organization. The company has offices throughout the world. This add-on comes from the Daytona Beach division.

**AviatorPro 98
For Microsoft
Flight Simulator
98**

FlightSafety International
PO Box 11527
Daytona Beach, FL 32120
Phone: (904) 226-4900
Fax: (904) 226-4910
Internet: <http://www.flightsafety.com>
SRP: \$29.95

Real World Data Microsoft and Jeppesen Agreement

An overwhelming number of airlines and professional pilots throughout the world use Jeppesen charts and maps for their primary flight reference source. Recently, Microsoft and Jeppesen signed an agreement that makes the Jeppesen navigational information available for future versions of Microsoft Flight Simulator.



According to Microsoft, the Jeppesen information includes data for more than 12,500 airports including over 32,000 runways and 70,000 navigation waypoints worldwide. This makes Flight Simulator even closer to real-world aviation.

For More Information

Microsoft
One Microsoft Way
Redmond, WA 98009
Internet: <http://www.microsoft.com/games/fsim>

Flight Link Realistic Instrument Stack

Chino-based Flink Link has introduced a new authentic training device that will be of interest to flight simmers. Dubbed the KR-1, this is a digital avionics stack that's designed especially for PC-based flight simulation.



This realistic instrument new stack is patterned after an actual King digital radio stack. On board are two KX-165 navigation and communication radios, a KR-87 ADF instrument, a KN61A DME instrument and a KFC-150 autopilot. Working knobs set the both OBS, the altimeter and DG. The marker beacons, landing gear indicator lights and Hobbs meter are also functional.

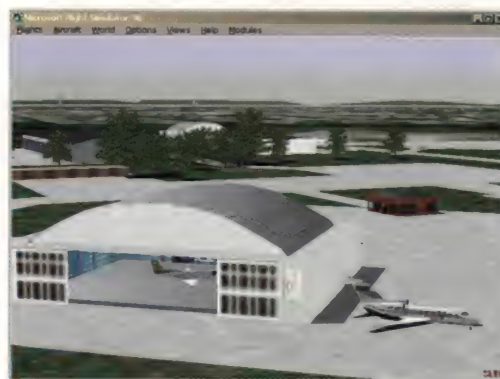
The KR-1 communicates with your PC through an EPIC-interface card which is included as part of the package. The KR-1 is available immediately. Contact Flight Link for pricing information.

Flight Link
KR-1
For Windows
95

Flight Link
275 Fairchild Ave Suite 100B
Chico, CA 95973
Phone 530-891-4987
Fax 530-891-0405
Internet <http://www.flight-link.com>
Contact Flight Link for pricing

Pennsylvania/New Jersey Justin Tyme's Latest Scenery

Full Throttle columnist, scenery-design activist and late-night regular Justin Tyme has released his newest scenery. PANJ98 covers all of Pennsylvania, all of New Jersey, and parts of southern upstate New York west of the Hudson River and south of a line extending east from Pennsylvania's northern border.



This extensive scenery includes about 200 airports and has accurate terrain, topography, rivers and lakes, cities and towns. In addition to nav aids, PANJ98 includes tower, ground control, clearance delivery, approach and departure control, and center frequencies.



There are also custom dynamic scenery at many airports and pilot-controlled lighting (PCL) at the appropriate airports. This newest scenery is compatible with the default NYC and other existing FSGenesis sceneries.

PANJ98
Scenery
For: Microsoft
FS98

FSGenesis
604 Whittier Drive
Indiana, PA 15701 USA
Internet <http://www.fsgenesis.com>
Price: \$15.95

New Zealand Scenery A View of Down Under

A mention of New Zealand usually conjures up thoughts of running water and beautiful mountains and lush green vegetation. Does this appeal to you? If so, then download Philip Middlemiss' **New Zealand** scenery



This download includes more than 100 airports on both the North and South islands of New Zealand complete with VORs, NDBs and other navigational aids. Visit Philip's site for more information.

New Zealand Scenery For Microsoft FS95 and FS98

Freeware 1.2 MB

By: Philip Middlemiss

Christchurch, N.Z.

Internet <http://home.clear.net.nz/pages/middlemiss/flightsim.htm>

Burrrrr... It's Cold Fly the the World's Coldest Places

If you're an adventurous type, you might want to hop in your plane and fly down to the South Pole. Or the North Pole. Or the Siberian Tundra. With the **Cold Lands of the Earth** scenery, you can visit them all and other icy places too.



Cold Lands takes you to Alaska, Antarctic Region, Iceland, Krasnoyarsk Kray territory, Murmansk, McMurdo Station, Siberia and Svalbard Island.

Cold Lands is a compilation of separate sceneries made by these authors: Rick Schuitemaker, Dean Salman, Valentin, Tim Vasquez, Stuart White, Dan Geis and Ulf Norlinger. Ferdy Serena, the webmaster at **FS Planet** has combined them into a single download package which is available only from the FS Planet site.

Cold Lands

Scenery

For: Microsoft

FS95 and

FS98

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Snake Bit

Have you ever been bitten by a snake? People that have usually hope it never occurs to them again. On July 15th of this year I was bitten by a different kind of snake: General Dynamic's F-16 Viper. I wish I could be bitten again.

How can I explain riding in one of the world's premier fighter jets? As I was in the plane, I realized how hard it would be to

write this article and convey the experience that I had. I could sum this whole story up in one word: YEEHAW!!!!

If you have followed previous issues of *Full Throttle*, you'll remember that I did an article on Major Jeff (Jethro) Traver and his experiences flying the F-16 (see the April/May 1998 issue). Major Traver flew with me to Terre Haute, Indiana to accompany me on my flight. Although Jethro was not able to take me on the flight, he did introduce me to the guys—this used to be his squadron when he lived in southern Indiana.

Arrival was slightly IFR with weather closing in, so there was concern that we may not be able to make the planned flight. Getting the ride of my dreams was not easy. With miscommunications, all the red tape and waiting, I was becoming restless and a bit skeptical about the whole event. In addition, if you know anything about civilians getting rides in military fighter jets, you know that it just does not happen anymore.

After arriving and meeting the "Racers" 113th Fighter Squadron and spending some time degrading Jethro with the guys, I was brought back to the Life Support unit to be fitted with my "G" suit, shoes, gloves, helmet, and more. All the hardware these guys have to strap on before they can get in the plane is amazing.

Having been fitted and assigned my "wardrobe," it was time to do some Egress training. In Egress, they use a mockup F-16 cockpit with all the instruments and switches to explain all the functions that are pertinent to you. For instance, I had



to prove that I knew how to arm and engage the ejection seat, if by chance the viper or pilot decided to "check out" while in flight. I was also instructed how to work the radios and how to prepare myself for an emergency escape, both on the ground and in the air. I guess they did not realize how observant I was until I asked what was the purpose of a specific radio switch. The guys looked at each other, then at me and said, "Classified." Uh-huh. My guess is it's probably a direct line to the local pizza pub.

Several people were getting "incentive rides" that afternoon. We jumped in "Watchdog" (the unit pickup) and drove out to the flight line to watch them take-off.

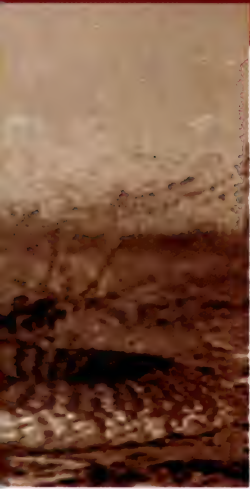
The F-16 taking off with afterburner is a

My Ride In An F-16 Viper

By Jim Rhoads



Snake Bit: My Ride In An F-16 Viper



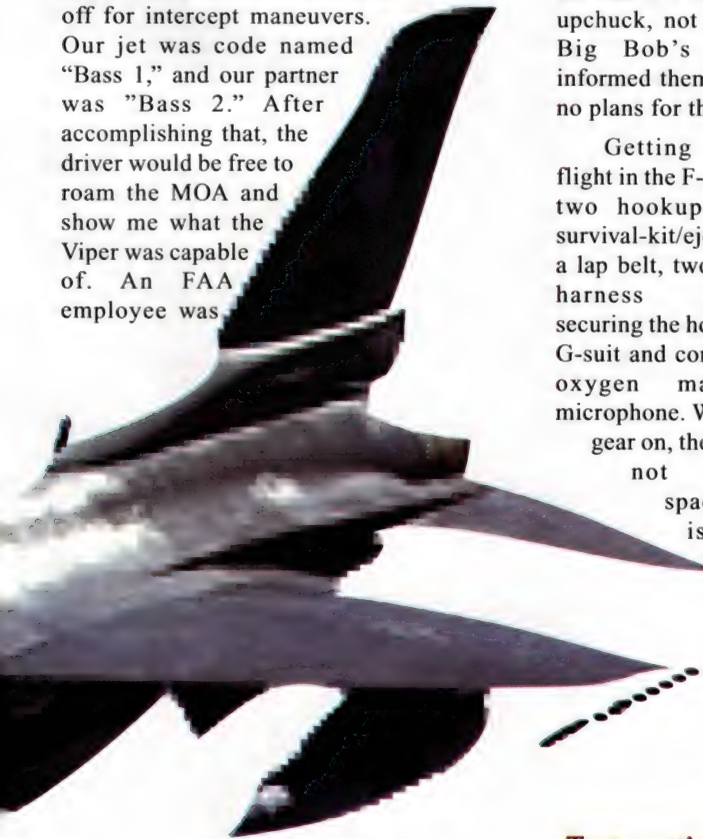
(Top, middle and below) I was brought to the Life Support unit to be fitted with my "G" suit, shoes, gloves, helmet, and more (also see top of the next page).

All the hardware these guys have to strap on before they can get in the plane is amazing.



beautiful sight. Even with ear protection on it was incredibly loud, and I could feel the shock rattle my chest. Watching the shock "diamonds" from the rear of the F-16 on departure is magnificent.

Before the proposed flight, we met in the briefing room to discuss our purpose of flight and what we hoped to achieve. The flight would be limited to the Red Hills Military Operations Area (MOA) bordering and including southwest Indiana and southeast Illinois. We would go up in a two-ship formation and split off for intercept maneuvers. Our jet was code named "Bass 1," and our partner was "Bass 2." After accomplishing that, the driver would be free to roam the MOA and show me what the Viper was capable of. An FAA employee was



receiving an incentive ride in the other aircraft (Bass 2).

OK, it's party time! The pilot in command of my incentive flight was Jeff (Doogie) Houser. Watchdog dropped us off at the F-16, where Big Bob, the crew chief, was waiting to greet us. They don't call him Big Bob for nothing. The guys warned me that if I was going to upchuck, not to do it in Big Bob's plane. I informed them that I had no plans for that, thanks.

Getting ready for flight in the F-16 involves two hookups for the survival-kit/ejection seat, a lap belt, two parachute harness hookups, securing the hoses for the G-suit and combat edge, oxygen mask and microphone. With all my gear on, the cockpit is not overly spacious, but is very comfortable just the same. Once



Text continues on page 21



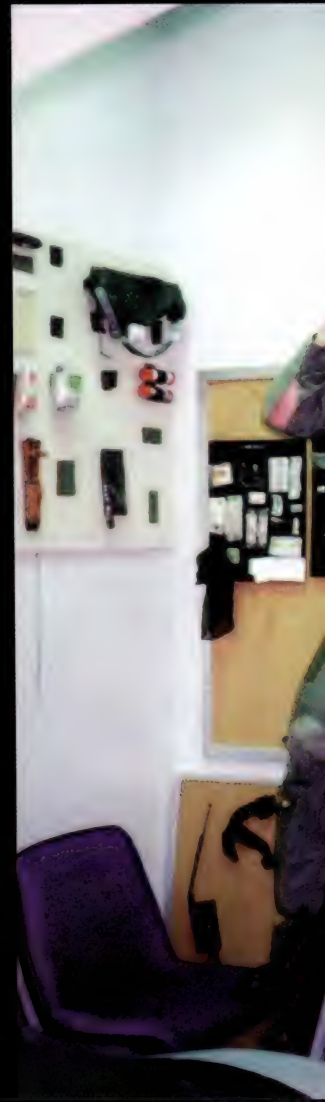
(Right, below and left) Being fitted with my "G" suit, shoes and gloves in Life Support.

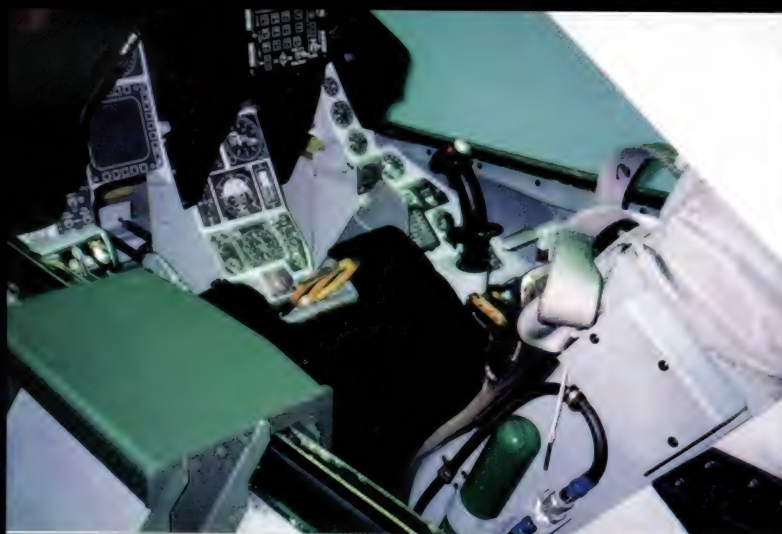
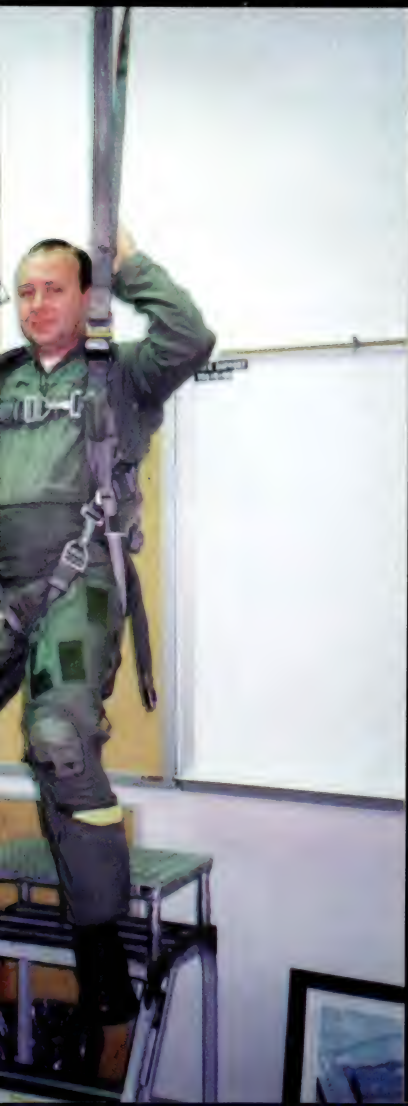


(Photos left, below and right) After being fitted for an F-16 "wardrobe," the next step was some Egress training.

In Egress, they use a mockup F-16 cockpit with all the instruments and switches to explain all the functions that are pertinent to you. I had to prove that I knew how to arm and engage the ejection seat.

I was also instructed how to work the radios and how to prepare myself for an emergency escape, both on the ground and in the air.





(Photo left) Your seat is essentially a small but powerful rocket designed to literally blast you several hundred feet straight up if you yank on the yellow handle between your legs. You're supposed to do this only if the pilot yells "bail out bail out bail out!"

(Photo right) The cockpit is not overly spacious but even with all my gear on, it's very comfortable just the same.

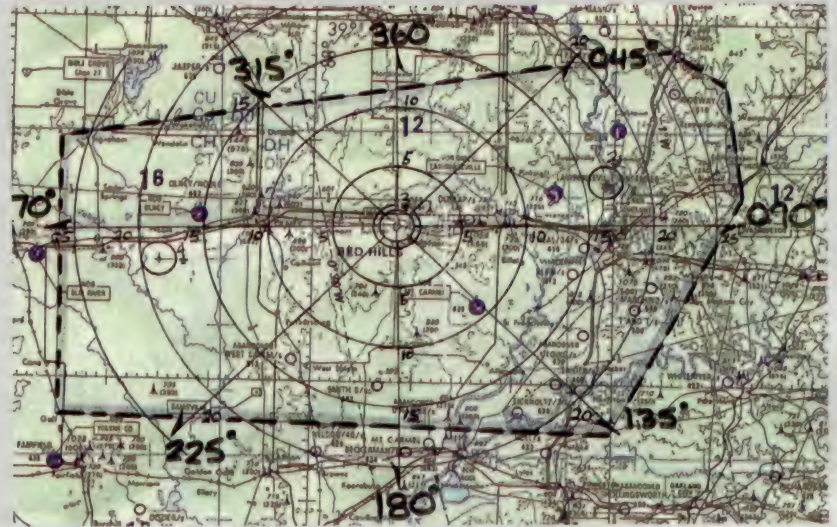


Snake Bit: My Ride In An F-16 Viper



(Above and above right) We met in the briefing room before the proposed flight to discuss our purpose of flight and what we hoped to achieve.

The flight would be limited to the Red Hills Military Operations Area (MOA) bordering and including southwest Indiana and southeast Illinois (refer to the flight map on the right).



(Above and above right) The pilot in command of my incentive flight was Jeff (Doogie) Houser. Watchdog dropped us off at the F-16, where Big Bob, the crew chief, was waiting to greet us. They don't call him Big Bob for nothing. The guys warned me that if I was going to upchuck, not to do it in Big Bob's plane.



Once all hooked up, the canopy goes down, the jet spools up and Big Bob and two other gentleman preflight the aircraft, calling out instructions and verifying the response.



all hooked up, the canopy goes down, the jet spools up and Big Bob and two other gentleman preflight the aircraft, calling out instructions and verifying the response.

Once preflight was confirmed, Doogie and I taxied to runway 23 and waited for Bass 2 to meet us for departure. Hullman Field has cables on both ends of the runway to slow the aircraft down in case of an emergency on arrival or departure. After a cable request from the tower, Doogie fired the viper up to 90%, and after all vitals checked out, we were on the roll.

OK, I know you're thinking, "What does an F-16 afterburner take-off feel like?" It's probably like strapping a JATO unit to your daughter's mini bike. It's very hard to

explain, but very enjoyable. The view from the cockpit is nearly unrestricted. Of course, being in the back seat of a two-seat "D" model does limit the view directly in front of you. But as the pilot, you would be able to see in almost any angle.

The weather on the ground was lousy with very low ceiling and visibility. But that was no problem for the F-16, and in a couple minutes we were at 10,000 ft with nothing but blue sky above and clouds below. Bass 2 met up with us shortly, and after taking a few pictures, we split off to do intercepts. This was really cool and interesting, because we were imitating enemy ships, tracking and intercepting just as in real life. You know when the enemy ship has you locked on because you hear a noise that sounds like a

chipmunk convention: lots of warbles and chirps. During this whole process, Doogie explained to me where Bass 2 was according to the HUD (heads up display) and where to look to get a visual lock. The F-16 is very hard to spot visually because of its sleek profile, especially when it is coming at you or on a knife-edge.

After two interceptions, we decided to break off and roam the Red Hills MOA to learn what this bird could do. First off, Doogie asked me what I had in mind. This was easy to answer, "Do an aileron roll!" Doogie demonstrated one, and then it was my turn. The first one was a little choppy, but the second one (if I dare say so) was very good. The F-16 can do an aileron roll faster than you can say the words. The controls felt the same to me as the F-16 simulator I flew at the Ft. Wayne National Guard unit. It's very tight and responsive, as if it knows your thoughts. No PC simulator to date has been released to the public that flies like an F-16 (although I am aware of one in the works).

Doogie asked if I wanted to do some "G" awareness maneuvers, which is a very nice way to say, "Let's wrench your guts out, OK?" Of course, I was game and Doogie initiated 3.5 Gs. He asks, "How are you doing?" OK, fine I said. "Are you sure?" said Doogie. Yeah, I'm OK, no problem. (Doogie) "Are you ready to go a little more?" (Me) "Hey, you're the captain—do what you want." (Doogie) "OK... Well, we got 7.5 that time, are you OK?" (Me) Wow! Yeah, I'm OK. That's pretty intense. (Doogie) "You're sure you're OK?" (Me) "Yeah, no problem." (Doogie) "Great, we'll get 9 Gs for sure out of you today." This went on a few times more until we snatched nine Gs. The only way I can explain the feeling of doing nine Gs is that it feels like some kind of kind of 900-pound amoeba is on your head, trying to suck the very life out of you. Cool, huh? After verifying I could take the Gs, we did some inverted S-turns, loops, and anything else that Doogie could come up with.



...If ever there is a war that endangers our country, I will feel confident knowing that the F-16 and the great, skilled guys that fly them are up there doing their job!...

Sadly enough, all good things come to an end, and so it was for my ride in the F-16. We spent approximately an hour in the air before returning to HUF for a low pass and a normal landing. By the way, nice job Doogie. My ride in the F-16 is one I will never forget, and I feel very fortunate and honored that the United States Air Force and the 113th Fighter Squadron allowed me to experience this magnificent piece of hardware.

Many men dream of flying in a modern fighter jet, and believe me when I say I do not take lightly the fact that I was selected for such a rare experience.

If ever there is a war that endangers our country, I will feel confident knowing that the F-16 and the great, skilled guys that fly them are up there doing their job!

Special thanks to:

Mayor Bob McCallen

Governor of Indiana Frank O'Bannon

Colonel Stuart Goodwin

Squadron Commander Gary Kurdys

Jeff (Doogie) Houser

Jeff (Jethro) Traver

And all the others that made my dream possible.





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Big Jet Fuel In MS Flight

By Eric Mitchell

When people first try flying airliners in Flight Simulator, they usually have many of the same questions and comments: What is a good cruising altitude for this aircraft? How fast should I be flying? Should I use Mach number, True Airspeed or Indicated Airspeed? Okay, I'm flying along at M0.72 at 30,000', so how come the aircraft keeps stalling? This airplane is almost impossible to land—it feels sluggish and stalls just as I begin my approach. How can I tell how much fuel I'll need for a flight? I always run out of fuel way before I've covered the published range—what's going on?

This article will answer these questions and more as we discuss how to set the fuel load for large transport aircraft and how to conduct a realistic flight. It will not only be more realistic, it will actually be easier, and the experience will be that much more satisfying at the same time!

At first glance, fuel management looks like a simple and mundane task, hardly worth more than a passing glance. However, except for the physical state of the aircraft itself, fuel is the most important factor in powered flight. Obviously, burning fuel provides the propulsive force that moves the aircraft fast enough to fly, but there's really much more to it than that. In real aviation, fuel management is one of the primary concerns of the pilot of any aircraft, from Cessna to Concorde. Yet, many Flight Simulator pilots pay little or no attention to it!

Why not just fill 'er up?

In our daily lives, we regularly drive our cars to filling stations and fill the tank—it's pretty straightforward. However, an aircraft has an additional problem: the aircraft, including crew, passengers, baggage *and fuel* must be moved fast enough for the wings to lift all that stuff into the air and keep it there, often for many hours. The heavier the aircraft is, the more power (and therefore fuel) is required to move it. At the same time, the more fuel you carry, the heavier the aircraft is! In fact, if you fill the tanks on a short to

medium-length flight, there comes a point when much of the fuel you're adding will be consumed just to carry the weight of unnecessary fuel!

Furthermore, the heavier the aircraft is, the more inertia it has, often making it more difficult to handle. One of the biggest problems beginning FS flyers encounter is trying to land large jet airliners. Almost invariably it is because they have taken off with a full fuel load and then immediately tried to turn back for a practice landing. This won't work in the real world, and it doesn't work in FS, either. If you try to land with a full fuel load using the normal approach speed, the aircraft will be slow to respond to control inputs, it will require a very high angle of attack (AOA) and will eventually stall and crash short of the runway. If you maintain a high enough speed to remain airborne, the aircraft will probably bounce dangerously on landing and may be moving too fast to be stopped in the length of the runway. Therefore, always ensure that you have about 10% fuel on board when attempting a landing. Ideally, this is accomplished by only carrying enough fuel to reach the destination, rather than by manipulating the fuel load in the FS Aircraft Settings menu while on approach.

Management Simulator

Fuel Management In MS Flight Simulator

Careful planning is required to make sure that the aircraft finishes the flight within landing weight limits, while ensuring that it doesn't run out of fuel either. In other words, the optimum situation is one in which the aircraft lands with the minimum amount of fuel on board. By law this minimum includes sufficient fuel to reach an alternate airport should the destination be unavailable due to weather or unforeseen circumstances. Flying with more fuel than is strictly necessary is called *tankering*, and because the aircraft has to burn more fuel to carry the greater weight, the practice is greatly frowned upon by the folks who pay the bills.

This article addresses the theory and practical aspects of fuel management in large jet transport aircraft in Flight Simulator, which is simplified from that of real life. Although Flight Simulator is generally a realistic simulation and many of the techniques described are derived from real-world methods, fuel management is more complex than this. Use these techniques for simulated flight only!

The Earth's Atmosphere

Before we get into the practical details of fuel management, there are a few things you need to understand about the earth's atmosphere, the medium we'll be flying through.

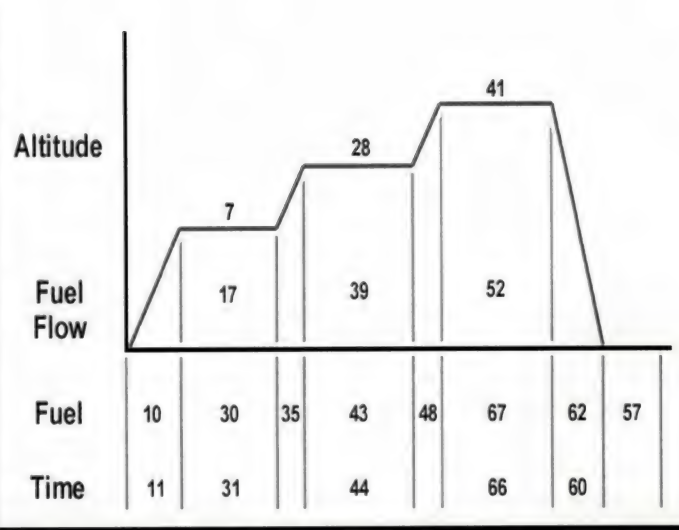
First, the air becomes less dense, or thinner, as we ascend in altitude. For example, the air at 18,000 feet is about half as dense as the air at sea level. Because interaction of the aircraft surfaces with the air causes resistance, or "drag," on an aircraft, the less dense air at higher altitudes allows the aircraft to fly with less resistance, thus flying faster and more economically. And even though climbing up to higher altitudes uses more fuel than maintaining level flight, it is usually worth while for a flight of any great duration. The higher speeds at higher altitudes also contribute to increased engine efficiency in turbofan engines. This effect is still significant, despite the fact that the air at higher altitudes is less dense.

However, there is a limit to how high an aircraft can climb, and this too is imposed by the decrease in air density. As the aircraft climbs higher, the wings generate less and

less lift in the thinner air. Eventually the aircraft can climb no more and is said to have reached its ceiling. The altitude at which this occurs varies with aircraft type and weight—the less a given aircraft is carrying, the higher it can climb.

It's easy to see then that in the initial climb after take-off, when the aircraft is at its heaviest, it won't be able to climb to its maximum ceiling. Later in the flight, after some of the fuel has been consumed, the aircraft can climb higher.

The most economical flight profile for large subsonic transport aircraft is to set and maintain a given Mach number (usually between M 0.75 and 0.85, depending on the aerodynamic properties of the wing). Let the aircraft climb gradually on its own as fuel is burned off and the load lightens. The reality of hundreds of aircraft sharing the same



Flight Profile Diagram

The numbers correspond to line numbers on the worksheet.

airspace precludes this technique, so large civil and military transports use a "step climb" procedure, in which they periodically climb to progressively higher altitudes in coordination with Air Traffic Control (ATC).

By following the steps in this article and completing the accompanying Airliner Performance Worksheet, you'll be able to

Table 1 - Fuel Information for Various airliners

Aircraft type	MGTOW	Fuel (lbs.)	Max ZFW
Airbus 300-600	363,765	109,760	286,600
Airbus 310-200	313,055	97,224	249,120
Airbus 320	162,040	42,238	133,380
Airbus 330	467,380	171,855	361,560
Airbus 340-200	566,588	238,900	381,400
Boeing 737-400	138,500	35,052	113,000
Boeing 747-400	800,000	356,380	535,000
Boeing 757	220,000	74,290	184,000
Boeing 767-200	300,000	110,245	248,000
Boeing 777-200	535,000	204,650	420,000
MD-11	625,500	265,268	400,000
MD-81	140,000	39,162	118,000
MD-87	149,500	46,773	112,000
MD-90-30	156,000	38,550	130,000

Sources: Jane's and Aviation Week



Fuel Management In MS Flight Simulator

determine the initial cruising altitude for an airliner model, as well as when and how high to "step up" to higher altitudes.

The calculations involved require only basic arithmetic, but you may want a hand-held calculator to speed things up. The worksheet may look suspiciously like a tax form, but I hope it will be more interesting and at least a little bit more fun! (See the Flight Profile Diagram at the top of this page.)

Measuring Speed

Anyone who has spent any time with Flight Simulator will know that speed is one of the most critical factors of flight. What they may not immediately realize is that the concept of speed in aviation can be hard to pin down. Again, most people's daily experience in this regard is with cars, which measure speed in an easily understood way: you travel so many miles over a certain period of time, and that is the speed of the vehicle. As usual, it's a little more complicated with aircraft.

That familiar way of measuring speed over the ground is called ground speed (GS) in aviation and although very important overall, and especially for fuel management, it is not the aviator's most immediate

The Aircraft Dynamics Editor (ADE) - note ZFW and clean stall.

concern. First and foremost, the pilot has to ensure that the aircraft can stay airborne. This means the speed of the aircraft through the air must be known and this can differ greatly from ground speed, depending on the density of the air and the wind velocity.

The most basic airspeed measurement is Indicated Air Speed (IAS). This is simply the difference between the ambient static pressure and the air pressure in the pitot tube caused by the forward motion of the aircraft. As we have already seen, ambient pressure (density) can change significantly, especially with altitude, and thus IAS readings are highly dependant on aircraft altitude as well as speed. It does, however, give a good indication of how close the aircraft is to stall speed at any altitude.

Calibrated Air Speed (CAS) is indicated airspeed corrected for installation error, which is usually very small. Light aircraft usually use a small table that gives correction factors for various IAS readings displayed on or near the instrument panel. We don't concern ourselves too much with CAS in Flight Simulator flying.

Equivalent Air Speed (EAS) is CAS corrected for the effects of compressibility, which is the tendency for air pressure to build up faster inside the pitot tube than the aircraft is really moving. This occurs because air is very easily compressed, but it is normally only experienced by high-performance aircraft at high speeds.

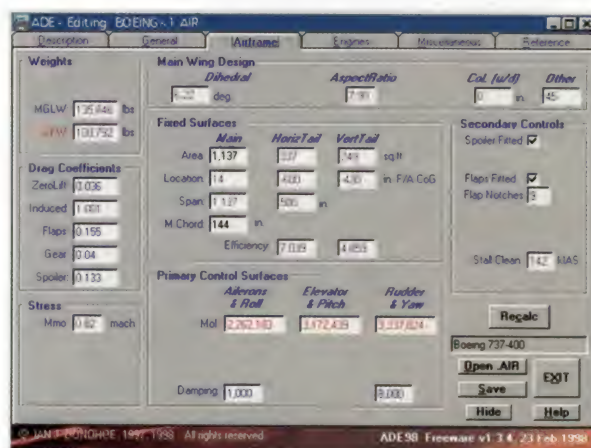
The other commonly used airspeed measurement is True Air Speed (TAS). This is the CAS or EAS corrected for air density and is the actual speed of the aircraft through the air

mass. If there is no wind, TAS is the same as ground speed. Because TAS increases steadily with altitude compared to IAS, it is preferable to monitor Mach number and IAS at cruise rather than TAS. It is possible to have a deceptively high TAS while the IAS is dangerously close to stall speed.

Mach number (M) is the ratio of TAS to the speed of sound at the current altitude. As with TAS, the speed of sound varies with air density, so this provides a relatively constant speed reference to the pilot at higher altitudes. It is usually used at altitudes above 20,000'.

The air in the atmosphere is never static. Changes in pressure and temperature are occurring and interacting with each other all the time, causing the air to move, or in other words, creating wind. Wind can occur as a localized phenomenon or it can affect a large area as a weather system sweeps across the earth. Global air currents, called jet streams, form at high altitude and exceed 100 knots.

All this moving air has a profound effect on the flight path and ground speed of the aircraft. Ground speed is what concerns us for fuel planning, because it directly affects how long the flight will take (a lower GS means a longer flight) and the length of the flight determines the amount of fuel that will be burned. Remember that for the sake of efficiency, large transport aircraft normally maintain a constant airspeed within a given air mass, without regard to ground speed.



FS ZFW	Range	Cruise speed
254,005	3,600	M0.80
215,831	3,670	M0.80
119,802	2,800	M0.80
295,525	4,500	M0.82
327,688	7,500	M0.82
103,448	2,700	M0.74
443,620	8,239	M0.86
145,710	2,820	M0.81
189,755	3,160	M0.80
330,350	4,050	M0.83
360,232	6,791	M0.83
100,838	1,630	M0.76
102,727	2,980	M0.76
117,450	2266	M0.76

Fuel Management In MS Flight Simulator

To better understand this effect, picture a goldfish swimming in a bowl. The fish may be swimming in a certain direction, but if someone picks up the bowl and moves it, the path the fish takes relative to the ground is very different to the path it perceives it is taking through the water in the bowl. This is something like what happens to an aircraft flying within a moving air mass.

For the purposes of completing the worksheet, make sure that the wind layers are set to zero or deleted in the **World | Weather** menu and check the **World | Weather Areas** menu as well, turning off any active weather areas. Later, when you're planning your flights, you'll need to adjust the planned ground speed based on the enroute winds (this is a subject for a different article).

Worksheet: Determining the MGTOW Fuel load

Initially, we'll need to know a few things about our aircraft to plan and manage its fuel consumption: the Maximum Gross Take-Off Weight (MGTOW), Zero Fuel Weight (ZFW), fuel capacity, range, initial cruising altitude and speed, and the fuel consumption at cruise. Some of these figures can be obtained from public sources, such as *Jane's All the World's Aircraft* or *Aviation Week and Space Technology*. Other items can be obtained directly from the model itself by using a utility such as Aircraft Dynamics Editor (ADE), or simply by test-flying the aircraft. We'll use all of these techniques to evaluate Flight Simulator airliners, and to illustrate this process I'll use the default Boeing 737.

For this exercise, start at any airport suitable for your aircraft type, preferably one close to sea level, such as Miami or San Francisco. Select the aircraft and set the fuel tank levels to 100% in the **Aircraft Settings | Fuel** menu. This will approximate the MGTOW. While in the **Fuel** menu, note the total weight of fuel on board. It is possible to set the MGTOW fuel more precisely using ADE to find out what ZFW weight the designer has assigned to the model. Just look in the **Airframe** tab for aircraft weights. You

can then calculate the correct MGTOW fuel load by following the first three lines on the worksheet.

For our example, the MGTOW listed in Jane's for the 737-400 is 138,500 lbs, and the ZFW from ADE is 100,792 lbs.

Therefore, for the default 737-400:

MGTOW - ZFW = MGTOW Fuel Weight in lbs.

138,500 lbs - 100,792 lbs = 37,708 lbs

However, the maximum fuel load for the aircraft model (and the real aircraft) is only 35,052 lbs. This is because MS has set the ZFW lower than the maximum for the real aircraft, which is actually 113,000 lbs., to ensure that simulator pilots don't inadvertently make an over-weight take-off.

Some third-party aircraft designers may not make such allowances, so it is best to check the numbers as described above. In this case, the fuel tanks should be set to 100% full. If the MGTOW fuel load is less than the available fuel capacity, be sure to divide the difference evenly among the tanks when setting the levels.

See Table 1 for some typical real-world weights, fuel capacities, ranges and cruise speeds. I have included suggested ZFW figures to make the total weight come out to MGTOW weight in Flight Simulator. Finish Part 1 of the worksheet now.

For Flight Simulator aircraft designers, and for those who wish to modify a model so that it can fly to its nominal maximum range, you can rearrange the above equation using total fuel capacity to determine a suitable ZFW figure:

MGTOW - Total Fuel Weight = ZFW

Setting the aircraft weights this way provides the user with the most flexibility: a correct-weight MGTOW take-off can be made and the aircraft will have enough fuel to fly to its maximum range.

Determining Initial Cruise Altitude

In the Cruise section of the 737-400 Aircraft Handbook in the FS98 Pilot's Help menu, MS suggests cruising at FL 330 or FL 370 westbound and FL 310 or FL 350

eastbound. However, after executing a MGTOW, departure you will find it difficult to reach those altitudes on the initial climb, and doing so will require you to burn a lot of extra fuel (and to run the engines above the red line) to climb the last few thousand feet.

Here's a method that you can use to determine a realistic initial cruise altitude, complete Part 2 of the worksheet as you perform the following tasks:

If it's not already set, go into the **Options** menu and select **Preferences** and then **Instrument**. Locate the line "Display Indicated Airspeed" and select the checkbox on.

On the Autopilot panel or in the **Aircraft | Autopilot** menu, set the altitude to a setting well above the expected cruising altitude, something like 50,000', and make sure that the Autopilot is off.

The figures in this example are for the default 737; other aircraft will exhibit slightly different performance characteristics. To start, note the time, then perform a normal take-off according to the manual, and initiate a climb to cruise altitude according to the 737 take-off checklist.

Activate the Autopilot (**Z**) and engage the Altitude Hold by pressing the **Alt** button on the Autopilot panel with the mouse. Avoid using the keyboard command **Ctrl+Z**; it will cause the altitude to reset to the current altitude and the aircraft will level off. Verify that the Autopilot vertical speed setting is at +1,800, and adjust it manually using the mouse if it isn't.

Retract the flaps at 175 KIAS and as the speed increases through 210 KIAS pull the power back to about 82% N1 and 700 EGT to stay under 250 KIAS while below 10,000'. Through 10,000' smoothly increase power to 92% and 780 EGT, letting the Autopilot maintain the climb attitude.

The EGT should remain constant and the %N1 reading will increase slightly as we climb. By 17,000' the IAS has peaked at 270 to 280 KIAS and then begun to drop slowly. The IAS and the Vertical Speed Indicator (VSI) are two items that you must monitor very closely during the climb.

Through 27,000', the IAS has dropped to 200 KIAS. The VSI appears to be slowly dropping as well and is now reading 1,600 fpm. By 28,300', the instruments are showing



**Part 1:
Determine MGTOW
Fuel Load**

1. Maximum Gross Take-Off Weight (MGTOW) from references or Table 1: _____ lbs
2. Zero Fuel Weight (ZFW) from ADE: _____ lbs
(Note: to convert US gallons to pounds, multiply by 6.6015)
3. Calculated MGTOW Fuel Load-Subtract line 2 from line 1: _____ lbs
4. Total Fuel Load-from **Aircraft | Aircraft Settings | Fuel** menu: _____ lbs
5. MGTOW Fuel Load-line 3 or 4, whichever is less: _____ lbs

**Part 2:
Determine Initial
Cruise Altitude**

6. Time at brake release: _____
7. Initial cruise altitude (round off to nearest 1,000): _____ ft
8. Time at level-off from climb: _____
9. Fuel remaining after climb-from **Aircraft | Aircraft Settings | Fuel** menu: _____ lbs
10. Climb fuel-Subtract line 9 from line 5: _____ lbs
11. Time to climb to cruise altitude-Subtract line 8 from line 6: _____ hrs

**Part 3:
Measure Fuel
Consumption at
Initial Cruise Altitude**

12. Cruise speed-(Mach number) from references or Table 1: M _____
13. True Airspeed (TAS) from airspeed indicator (set to read TAS): _____ kts
14. Total Fuel Weight at beginning of timed run: _____ lbs
15. Total Fuel Weight at end of timed run: _____ lbs
16. Fuel used in six minutes-Subtract line 15 from line 14: _____ lbs
17. Convert to hourly fuel usage-Multiply line 16 by ten: _____ pph

**Part 4:
Determine Cruise
Ceiling (similar to
Part 2 above)**

18. Total Fuel Load with all tanks set to 15%: _____ lbs
19. Cruise ceiling (round off to nearest 1,000): _____ ft
20. TAS from airspeed indicator: _____ kts

**Part 5:
Determine
Fuel-Climb Factor
(FCF)**

21. Subtract line 7 from line 19 and divide by 1,000: _____
22. Fuel for cruise altitude span-Subtract line 18 and line 10 from line 5: _____ lbs
23. Fuel-Climb Factor (FCF)-Divide line 22 by line 21: _____

**Part 6:
Determine Flight
Time**

24. Sum of TAS readings-Add line 13 and line 20: _____ kts
25. Average TAS-Divide line 24 by 2: _____ kts
26. Nominal Range-from references or Table 1: _____ nm
27. Estimated Flight Time-Divide line 26 by line 25: _____ hrs
(This isn't precise, but will be close enough for planning purposes)

**Part 7:
Determine Time,
Distance and Fuel for
Initial Cruise**

28. Select Altitude for next step climb-based on ATC rules: _____ ft
29. Subtract line 7 from line 28 and then divide by 1,000: _____
30. Fuel to burn to get to step climb weight-Multiply line 23 by line 29: _____
31. Time to begin first climb-Divide line 30 by line 17: _____ hrs
32. Running total of flight time-Add line 11 and line 31: _____ hrs
33. Running total of fuel used-Add line 10 and line 30: _____ lbs

**Part 8:
Measure Fuel
Consumption at First
Step Climb Altitude**

34. Set Total Fuel-Subtract line 33 from line 5 (Now climb to next step climb altitude): _____ lbs
35. Fuel for Step Climb-Subtract current total fuel from line 34:
(Stabilize at cruise speed before proceeding to next step) _____ lbs
36. Total Fuel Weight at beginning of timed run: _____ lbs
37. Total Fuel Weight at end of timed run: _____ lbs
38. Fuel used in six minutes-Subtract line 37 from line 36: _____ lbs
39. Convert to hourly fuel usage-Multiply line 38 by ten: _____ pph
40. Running total of fuel used-Add line 33 and line 35: _____ lbs

**Part 9:
Determine Time,
Distance and Fuel for
Second Step**

41. Select Altitude for next step climb-based on ATC rules : _____ ft
42. Subtract line 28 from line 41 and then divide by 1,000 : _____
43. Fuel to burn to get to step climb weight-Multiply line 23 by line 42: _____
44. Time to next climb-Divide line 43 by line 39: _____ hrs
45. Running total of flight time-Add line 32 and line 44: _____ hrs
46. Running total of fuel used-Add line 40 and line 43 : _____ lbs

**Part 10:
Measure Fuel
Consumption at
Second Step Climb
Altitude**

47. Set Total Fuel-Subtract line 46 from line 5. *(Now climb to next step climb altitude):* _____ lbs
48. Fuel for Step Climb-Subtract current total fuel from line 47. *(Stabilize at cruise speed before proceeding to next step):* _____ lbs
49. Total Fuel Weight at beginning of timed run: _____ lbs
50. Total Fuel Weight at end of timed run: _____ lbs
51. Fuel used in six minutes-Subtract line 50 from line 49: _____ lbs
52. Convert to hourly fuel usage-Multiply line 51 by ten : _____ pph
53. Running total of fuel used-Add line 46 and line 48: _____ lbs

Repeat Parts 9 and 10 as necessary for additional step climbs-keep adding to the running total of fuel and flight time. The time and fuel for cruising at the final step climb altitude will be calculated in Part 13.

**Part 11:
IFR Fuel Reserves**

54. Rough IFR fuel weight-try 10% of line 5: _____ lbs
55. Fuel weight after timed run at 250 KIAS: _____ lbs
56. Fuel used in six minutes-Subtract line 55 from line 54: _____ lbs
57. IFR fuel reserves-Multiply line 56 by eight. Shortcut that converts to hourly rate and calculates the transit and approach fuel in one step. _____ lbs
58. Running total of fuel used-Add line 53 and line 57. You must assume that this reserve fuel is used so it isn't included in the enroute fuel calculations. _____ lbs

**Part 12:
Descent fuel**

59. Descent distance-Divide line 41 by 333.33 and round to nearest whole number. Subtract airfield elevation from line 41 before performing this calculation. _____ nm
60. Descent time-Divide line 41 by 1,800. *Subtract airfield elevation from line 41 before performing this calculation.* _____ min
61. Descent Fuel Flow: _____ pph
62. Descent Fuel used-Multiply line 61 by line 60 then divide by sixty: _____ lbs
63. Fuel for approach: _____ lbs
64. Running total of flight time-Add line 45 and line 60: _____ hrs
65. Running total of fuel used-Add line 62, line 63 and line 58: _____ lbs

**Part 13:
Fuel and Time for
Final Level of
Cruise**

66. Flight time-Subtract line 64 from line 27: _____ hrs
67. Fuel used-Multiply line 66 by line 52: _____ lbs
68. Running total of fuel used-Add line 65 and line 67: _____ lbs

**Part 14:
Determining Flight
Profile for Shorter
Trips**

69. Trip Fuel Load-Multiply Trip Distance by line 5. Divide result by line 26: _____ lbs
70. Fuel difference-Subtract line 69 from line 5: _____ lbs
71. Altitude difference-Divide line 70 by line 23 and round result to whole number: _____ ft
72. Multiply line 71 by 1,000: _____ ft
73. Initial Climb Altitude-Add line 7 and line 72. Go back to section 2 and complete the worksheet with this altitude. _____ ft



Approaching initial climb altitude - note VSI and IAS.

a climb rate of 1,000 fps at 180 KIAS. If the clean stall speed is not listed in the designer's documentation, you can view that in ADE as well: just go to the Airframe tab and look in the area marked *Secondary Controls*. The default 737 has a clean stall speed of 142 kts, however widespread practice is to keep IAS above 1.3 times stall speed (though some airlines use 1.2), or in this case, about 184 kts. For this example then, we'll level off at 29,000'.

The figures above will vary for different aircraft, so the key is to set the power to stay within EGT limits (90 to 95% N1 for most aircraft), to monitor the IAS and to watch for the VSI to drop to 1,000 fps. Complete the rest of Part 2 of the worksheet. Based on this experiment, a good initial cruise altitude for a MGTOW departure in the default 737 is 29,000'. The climb has taken 16 minutes and consumed a total of 3,254 lbs of fuel. Convert the time to hours by dividing it by 60. This will make it easier to add up the cumulative time later in the worksheet.

Don't forget ATC

When selecting an initial cruise altitude, you also need to consider ATC requirements for traffic separation. Aircraft travelling in an easterly direction (000°M to 179°M) on an IFR flight plan are assigned odd flight

levels (FL190, 210, etc) and those on westerly tracks (180°M to 359°M) fly at even-numbered flight levels (FL180, 200, etc). Beginning at FL290 (29,000' with 29.92 set on the altimeter), separation moves to 4,000', so easterly flights may be assigned flight levels 290, 330, 370 and so on, while westerly flights go to flight levels 310, 350, 390, etc. If the initial

climb altitude that you've determined through the process above doesn't correspond to one of these assignments, pick the next lowest one. From the standpoint of realism, particularly when creating ATC adventures, these are important things to consider.

Measuring Fuel Usage at Initial Cruise Altitude

Now that we've reached our initial cruise altitude, we can measure the fuel consumption at cruise. Most large transport aircraft cruise at between M0.72 and M0.85. The MS documentation indicates that the cruise speed for the 737-400 is M0.74, so leave climb power on until the speed starts increasing, and then reduce to 85% N1 and 665 EGT. Wait until the speed settles out, relying on the Autopilot to maintain altitude and heading. Be patient, this will take several minutes.

*Figure 4:
The fuel menu in FS98*

The first thing we need to know is the ground speed and if there is zero wind it's easy: ground speed is equal to TAS. To find the TAS at cruise speed, just go back into the **Options** menu and select **Preferences**, then **Instrument** and turn "Display Indicated Airspeed" off. The airspeed readout on the panel will now indicate TAS.

I have checked the TAS readout against various measures of distance travelled, including VOR/DME and GPS waypoint distance-to-go, and it is accurate enough for our purposes. You may find that at higher Mach numbers the TAS needle becomes "pegged" at 450 kts. If that happens, just go into the **World** menu, select **Go to** and then **Exact location** and look for the Airspeed box, which will continue to give an accurate reading. Click **Cancel** when you're finished checking it.

Once the speed, altitude and heading have been stabilised in cruise mode, pause the simulation by pressing the **[P]** key and then go into the **Aircraft | Aircraft Settings | Fuel** menu (see Figure 4). Note the total amount of fuel on board (in lbs.) on line 14 of the worksheet and then press **Cancel** to return to the main aircraft screen. Record the TAS (GS) on line 13 of the worksheet. Note the time showing on the panel clock and un-pause the simulation.

We'll let the sim run for exactly six minutes and then pause it again. While it is running, monitor the Mach number to make sure the aircraft is cruising steadily—if not, wait for it to stabilise again, note the fuel and the current time and then start timing again. Also note the Fuel Flow indicators. On the 737 panel, they're the lowest pair of dials in the engine instrument stack. These indicate



Fuel Management In MS Flight Simulator

the Fuel Flow (FF) for each engine, so for total fuel flow, add the two together and multiply by ten. I get 5,600 pounds per hour (PPH) in the default 737; however, we'll check that against the total fuel burned during the six-minute timed run.

After six minutes, pause the simulator and go back into the fuel menu and note the new total. Record the amount on line 15 of the worksheet and perform the calculation on line 16, which simply involves taking the difference between lines 14 and 15. In line 17, multiply that by ten (6 min X 10 = 1 hr) to get the actual hourly fuel flow. In this case I get 5,580 PPH, which is extremely close to the readings provided by the FF indicators. If you prefer, you can fly a longer timed run; just be sure to use the appropriate conversion factor to get the hourly rate:

- ✈ For a ten-minute run, multiply by six.
- ✈ For a twenty-minute run, multiply by three.

Determine the Cruise Ceiling

Next you'll need to find out how high the aircraft will be able to climb near the end of its flight when most of the fuel has been used. You can start where we left off with the process above if you like. Leaving the aircraft in Autopilot Altitude Hold mode, go into the **Aircraft Settings | Fuel** menu, and this time set all the tanks to 15% full. Note this total on line 18 of the worksheet. When the aircraft is stabilised at the new weight, go to the Autopilot panel's Altitude setting and increase it to 50,000' or more. Increase the power to the previous climb power and/or EGT setting that you used for the MGTOW test and follow the same procedure, monitoring the IAS and VSI to see how high the aircraft will climb with a light load. Record the cruise ceiling on line 19 of the worksheet. Stabilise the aircraft at cruise speed at the new altitude and note the TAS on line 20. In the default 737, I found that the speed dropped below 200 KIAS through 37,000' and the IAS dropped to 184 through 37,700', making the effective operational ceiling 38,000'.

Determine Fuel-Climb Factor

The Fuel-Climb Factor (FCF) is something I made up to provide a constant that can be used to make various calculations on the worksheet. It is simply the ratio of:

- The number of thousands of feet between the initial climb altitude and the effective ceiling, and
- The difference in fuel weight at those two altitudes.

It can be used to determine how much fuel needs to be burned to lighten the aircraft enough to enable a 1,000' climb. It is not precise because performance varies with altitude, but it will give us a useful estimate. I calculated a FCF of 2,889 for the default 737.

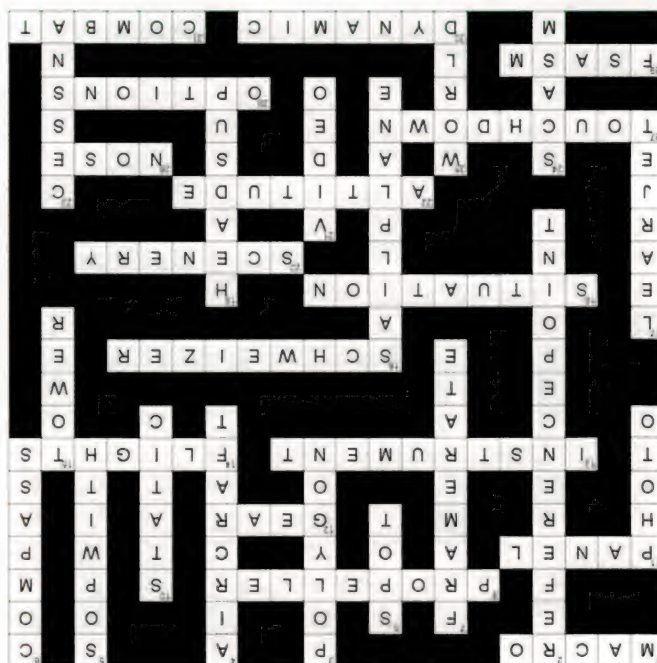
Determine Flight Time and Range

We'll also need to know how long the whole flight will take, assuming that a MGTOW departure is required to fly to the maximum range of the aircraft. First, average the TAS readings taken at initial cruise altitude and cruise ceiling then divide that by the published maximum flight range. Again this isn't precise, but is accurate enough for our purposes. It will be easier to perform later calculations if you leave this time as a decimal value in hours, rather than converting to hours and minutes.

Next time we will look at determining time, distance and fuel usage for the initial cruise, measuring fuel consumption during different altitude steps, fuel reserves, descent fuel and more.

CROSSWINDS

Here's the answers to the Crosswinds crossword puzzle that you'll find on page 48. We'll feature more Crosswinds in the future so let us know what you think. Write to adam@ftmagazine.com with "Crossword" for the subject header.



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Oshkosh is the grand Mecca of the aviation world. It is estimated that 10% of all the aircraft on the planet will be found at Oshkosh. Everything from ultralights to the latest experimental aircraft can be seen here. Vendors from all realms of aviation set up booths and tents to display their wares and new products. All of the big names in aviation can be found at Oshkosh as well: Patty Wagstaff, Sean Tucker, Bob Hoover, Chuck Yeager and the list goes on. In addition, you can count on them performing many times during the week-long event.

Although formerly called the "Oshkosh Fly-in convention," EAA has renamed the event the "EAA Airventure Oshkosh." EAA was founded in 1953 by Paul H. Poberezny, who invited a number of close friends and fellow homebuilding enthusiasts to a meeting at Milwaukee's Curtis Wright Field in January of that year. Paul was elected the

organization's president, a position he held for 37 years, when his son was elected to fill the post in 1989. For the first 11 years, EAA Headquarters was located in the basement of the Poberezny's home in Hales Corners, a Milwaukee suburb.

The first fly-in convention was held on September 12, 1953. The weekend gathering took place at Milwaukee's Curtis Wright Field, attracted a handful of airplanes and less than 40 people. In 1955 Paul wrote an article titled "How to build an airplane for less than \$800—with engine" for *Mechanics Illustrated Magazine*. The article created tremendous interest and sent EAA memberships soaring into the thousands.

EAA continued to grow and now has more than 170,000 members, young and old, pilot and non-pilot, representing virtually the entire spectrum of aviation. More than 900 chapters have grown from EAA's roots. EAA has several unique divisions available to

members interested in specific aircraft or activities, such as Antiques, Classics, Warbirds and Aerobatics. EAA also maintains a high profile in Washington D.C., so that its members' interests are presented and protected.

Airborne

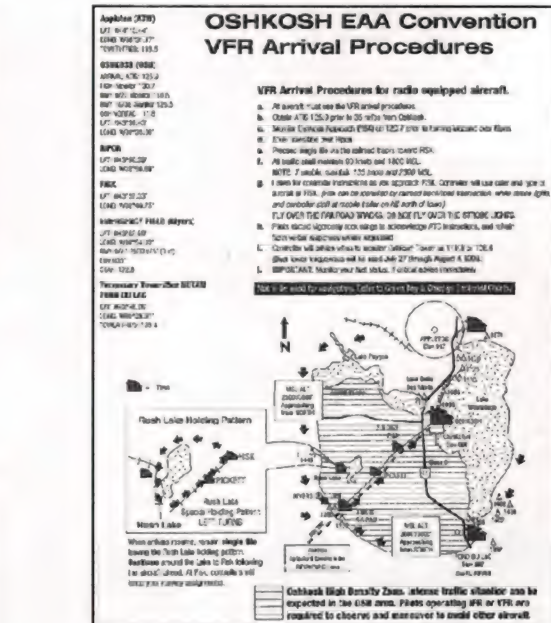
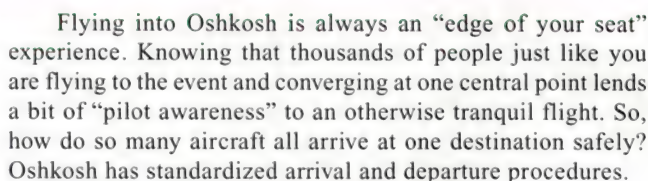
So, the day of reckoning has arrived. My accomplice, Ron Combs, and myself are departing for Oshkosh '98. Having packed everything on earth in our suitcases and bringing along plenty of money (for those four-dollar hotdogs, two-dollar cokes and anything else that we may be tempted by), we agree we are ready for Oshkosh.

After firing up the big Bonanza and filing the flight plan, we are off.

EAA Airventure Oshkosh

The announcement of the yearly Experimental Aircraft Association (EAA) event (held in Oshkosh, Wisconsin) makes diehard aviators salivate like Pavlov's dogs.



Full Throttle October-November 1998 www.ftmagazine.com

A pilot's first task is to monitor the ATIS frequency, starting 35 miles prior to entering Oshkosh. Then five miles out from the town of Rippon, things get exciting. Something is very spooky about listening to so many airplanes coming into one point. No one is allowed to converse on the frequency except those controlling the traffic. Acknowledgment is usually given by rocking the wings or lowering the gear, as instructed by the controller. If you have made it this far, the rest of the arrival procedure is pretty routine. Just listen up and do as you are told. Landing is done in sequence, and each approaching aircraft is given instructions to land on specific painted "dots" on the runway.

At that point, if you have done your homework well, you will know to have a sign to hold in the window to let ground crews know where you are parking. Ours was "GAC," general aircraft camping.

This year we chose to pitch a tent and stay at the airplane/campgrounds. If you are not the camping type, be sure and book your hotel reservations well in advance, like right now for next year's event. If you are the camping type, bring your mosquito repellent. These suckers are on steroids and should be required to have landing lights. And bring money. You will need plenty, so save up and plan on spending it. Oshkosh is expensive, but unlike other experiences, Oshkosh doesn't leave you feeling sorry you did it.

Plan on walking a lot. What can I say? Get used to it. Get some good, comfortable shoes, because you will do more walking than you can imagine. Buses run between the camping and aircraft parking areas, which helps ease the foot work a bit, but going anywhere from the drop off points still requires a lot of walking. Ron and I were fortunate to find a limousine, which was painted like a Holstein cow, to drive us into town and back. It was quite a hit with the locals.

The Oshkosh experience is hard to explain. It's like greeting an old friend that you haven't seen in years. The thousands of people and thousands of personalities have one common love: flying. Picture this—section after section and row after row of warbirds, classics, experimentals, rare limited production models, jets, general aviation, biplanes and ultralights. Look to the left and see 30 or 40 warbirds flying in staggered formations. Look to the right and see several acrobatic planes looping and rolling with smoke tracers. Look across the field and see general aviation aircraft arriving for the event one after another. Listen to the sound of a Mustang or Corsair literally screaming down the runway. Tents and displays everywhere highlight new aircraft and supplies. The buildings are full of vendors, and forums focus on anything you can think about related to aviation.

The smell of jet fuel and 100 LL enriches the air. Get the picture? In his wildest dreams, I am sure Mr. Poberezny never imagined the impact that he would have on the aviation community.

So, where does flight simulation fit into the Oshkosh scenario, and how important is it to the aviation community? It's very important. Microsoft and Sierra both recognize the importance and impact flight simulation has on the aviation community, and both attended this year's event. I was pleased to see the welcome that both companies received from the real-world aviators, as well as non-pilots. But why shouldn't they? After all, flight simulation affords us the ability to hone our skills and fly approaches that could otherwise be quite dangerous. It saves us money and

The Oshkosh experience is hard to explain. The thousands of people and thousands of personalities have one common love: flying. Picture this—section after section and row after row of warbirds, classics, experimentals, rare limited production models, jets, general aviation, biplanes and ultralights.

time, allowing us to fly many kinds of aircraft with different characteristics. With the low cost of computers today and the rapidly advancing technology of flight simulation, I believe a pilot is without excuse not to participate in the flight simulation world.

The National Association of Flight Instructors (NAFI) and EAA recognize this as well at Oshkosh. Both NAFI and EAA announced this year at Oshkosh that they are endorsing Sierra **Pro-Pilot 99** as a supplementary learning tool. NAFI and EAA plan to work with Pro-Pilot in achieving a high level of flight model accuracy and procedures, now and for future releases. This is quite an impressive endorsement and a positive step for all PC-based flight simulators.

Areas of Interest

Many vendors attended, and here is the scoop on what I saw at Oshkosh:

Microsoft

Microsoft displayed the upcoming **Combat Flight Simulator**, and I can tell you that it looked much more refined than when Tim Dickens and I saw it at the E³ convention in Atlanta. The scenery graphics are excellent and much different than we are accustomed to seeing.



Jim takes the left seat of a Beech KingAir.



Sights And Scenes From EAA Airventure Oshkosh





Examples from Microsoft's upcoming Combat Flight Simulator. The scenery graphics are excellent and much different than we are accustomed to seeing.

aircraft fragments into what looks like hundreds of pieces, along with smoke, fire and the whole visual experience that I imagine would occur in a dog fight.

All planes have specific "damage" areas. For instance, take a hit in the engine and you will see the

oil temperature rise, and because of the loss of oil, the engine will lockup. Take a hit in the wing and you could lose flaps and other hydraulics as a result of loss of fluid. You can actually see the damage on your plane: holes, burn marks, smoke damage, etc. Microsoft states that the engines will respond to different altitudes, just as in the real world, with specific behavior for each aircraft. Microsoft also indicated that you will be able to import other sceneries into Combat-Sim, which lends me to believe there will probably be some type of backward compatibility for current sceneries in FS2000. Dean Lester from Microsoft showed me a Lear jet that he imported into Combat-Sim, guns and all! Combat-Sim will import any FS plane and automatically assign the gun and cannon attributes to the aircraft. In addition, if you don't like the gun locations, you can edit the .TXT file and change the locations, just like editing a panel file. The release date is scheduled for late October or early November. Of all the combat sims I have seen so far, this will definitely be one to get. Look for a review in an upcoming *Full Throttle*.

Dynamix (Sierra)

Dynamix (pronounced *Dynamics*) made a public announcement for the release of **Pro-Pilot 99** at Oshkosh on Thursday, July 30th. I attended the private press party at the EAA Nature Center and was able to fly Pro-Pilot 99 first hand. Although it was in an early alpha stage, I was impressed with what I saw.

First, Pro-Pilot now supports 3-D. And although it was needed for sometime, what a difference it makes. The clouds are some of the most impressive I have seen in any simulator to date. Contrary to unpopular belief, the design team is working on making the flight models more accurate and assured me they would not stop until they and NAFI are satisfied. Pro-Pilot 99 will include an on-screen, pop-up operators handbook containing performance data, checklists, tutorials and personal notes.

Pro-Pilot 99 will include EAA *Flying Start* program information as part of the agreement between NAFI and EAA. *Flying Start* is an informational program designed to bring together local EAA chapters, CFI's flight schools and people who want to know about learning how to fly.

Also new to Pro-Pilot 99 is West Europe scenery, although there still will be no transatlantic flights due to the lack of an airplane that will support this type of flight. The scenery areas are separate for the time being. The aircraft will now have movable control surfaces for those that want more realism in outside views. Many airports now have lighted taxiways, and more are planned before the release in October. The ATC problems are now fixed and the flight planning wizard supports automatic route generation. For this release, Pro-Pilot 99 comes with a 285-pages flight guidance booklet and a "getting started" booklet. 3-D graphic acceleration supports Glide compatible 3Dfx cards and the following enhancements are provided:

- ✈ Sun glare
- ✈ Bilinear filtering (image smoothing)
- ✈ Alpha blending (transparency)
- ✈ Mip mapping
- ✈ Adjustable visibility and haze
- ✈ Translucent clouds

Previous owners of Pro-Pilot will be happy to know that a \$20.00 rebate will be available until December 31, 1998 (suggested retail price is set at \$49.99).

Quoting Mark Pechnick, senior designer and lead programmer:

Combat-Sim uses 16-bit texturing and elevation points on a 3-D mesh system. The hills, mountains and farmland are spectacular (covering the region between London and Berlin) and are based on real terrain data. This is obviously a taste of what is to come in FS2000. Even the planes seemed more accurately detailed. You can even see a silhouette of the pilot inside the canopy. Tracers from the guns and cannons look very good. What impressed me most was that when you shoot down an enemy plane, the



Examples from Pro-Pilot
 (top) Cessna over Parliament in London.
 (middle top) Beech Baron over Columbia, BC
 and (middle bottom) Beech KingAir over Mt.
 Rainier, WA. (Bottom) Joe Rush from Sierra/
 Dynamix demonstrates ProPilot 99

"Pro-Pilot is an ongoing development stream aimed at providing a realistic, PC-based platform flight simulation that aids beginning pilots in their ambition to become professionals. Also, we are aiming to create products that help experienced pilots become more proficient in general—hence the name "Pro-Pilot." We wanted to give users the experience of flight from this perspective."

As stated before, Pro-Pilot was in an early alpha stage when I saw it, and I have been made aware that many more things will be implemented for the scheduled release. Look for a review in an upcoming *Full Throttle*.

Flight Safety

Flight Safety has collaborated with Microsoft FS 98 to create an IFR adventure package titled *Aviator Pro 98*. In *AviatorPro 98* you will fly actual IFR flight plans in one of FlightSafety's Cessna 182RGs, using guidance and interactions with Air Traffic Control (ATC). You will need to keep the FAA Private Pilot Practical Test Standards (PTS) in mind as you brave the various challenges, both system malfunctions and weather. *AviatorPro 98* tracks your performance and will present you with a final score and a summary of your flight performance at the end of each of the five Adventures.

The five adventures include the following scenery areas:

- ✈ Northeast—Boston, MA area
- ✈ Southeast—Vero Beach, FL area
- ✈ Central – Grand Junction, CO area
- ✈ Northwest – Seattle, WA area
- ✈ Southwest – San Jose, NM area



Full Throttle will be reviewing this product in the very near future.

You can find more information on the Web at <http://www.flightsafety.com/microsoft/index.html>.

Control Vision

While at the show, I was able to try out a new personal simulator manufactured by Control Vision, titled *Sim Hawk*. *Sim Hawk* is a rugged steel and aluminum desktop module that incorporates all the controls and yoke in the same unit. All functions such as throttle, yoke, mixture, prop, radios, gear, etc., are all controlled on the desktop module, eliminating key strokes and adding a higher sense of realism to your simming experience. This is not some cheap, stamped-out plastic unit that will give you trouble in a few years. This thing is as rugged as the real thing, if not even more so! It even incorporates a built-in intercom and speakers and accommodates real aircraft headphones. Imagine flying audible adventure programs using this unit! I was impressed with this unit, and the pricing seemed fair for comparable units that exist. Stay tuned, as *Full Throttle* will be reviewing this product in the near future as well. You can find their Web site at <http://www.controlvision.com/frame.cfm?link=simhawk.htm>.

Accu-Flight

Accu-Flight manufactures a multi-axis simulator modeled after the Grumman Hellcat fighter.



The author gets a test ride in the Control Vision virtual cockpit

Accu-flight staff was working at Interactive Magic's "Warbirds" booth, displaying the Hellcat model. The **RT-7** sim presented there has both pitch (24 degrees) and roll (30 degrees) with a sliding canopy and 4-point harness to provide a "full immersion experience." This thing is built like a tank. I don't think the Grumman Hellcat was built as well as this model is! All platforms are built of welded steel construction (powder coated) with aircraft aluminum skin. Actual aircraft stick, throttle quadrant and rudder pedals are used in this sim platform. The unit takes approximately 4' by 6' of floor space and is ready to plug into a standard household outlet. There is no hydraulics, and the unit's motion is smooth and quiet. This simulator was originally designed for Flying Fighter Ace on the Internet gaming zone, but it was soon realized it could be accommodated to any sim software that was controlled by a joystick. However, the RT-7 is not directed to the general simmer (the price tag is \$14,995).

This is one incredibly built unit, which would do well as an airshow or mall business opportunity.

Now on the lighter side, I spent a little time with the Accu-Flight crew outside of the airshow and had a ball with these guys. Some of them are real Alaskan bush pilots with more stories than you can shake your joystick at! I really enjoyed hanging out with these guys and could sense a real dedication and enjoyment in what they do. I hope to get together with them again soon. Visit their Web site at <http://www.Accu-flight.com/>.

Gleim

For those wanting to expand beyond your simulation world and are ready to meet the challenges of real-world aviation, Gleim Publications makes training packages to assist you in getting your Private Pilot certificate. I spent a little time speaking to Gleim's representatives and Dr. Gleim himself at the show. Gleim Publications has study courses, from private pilot all the way up to Air Transport Pilot, that are user friendly, inexpensive and very effective. Dr. Gleim and his representatives seemed very eager and genuinely interested in seeing more people get involved in aviation. It was a joy to see Dr. Gleim approach the younger people and ask them questions about their interests



in aviation—you could tell he wasn't just trying to sell a product. Gleim Publications is making a limited offer for their private pilot kit, which includes everything you need except a flight instructor and the airplane, for \$95 delivered to your home. It even includes the flight bag! Visit <http://www.gleim.com/>.

Departure

Upcoming articles will be looking at many other products that I saw at Airventure Oshkosh '98. While there, Patty Wagstaff and Sean Tucker both agreed to interviews that *Full Throttle* will be publishing in the near future. Oshkosh is a great experience that you should partake of if you ever have the chance. You will surely not forget it. Every year I make more friends, see more things and become fonder of that special little place in Wisconsin named Oshkosh.



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Round Robin Adventure #3

New York - Maryland - Pennsylvania Area

By Al Pelletier

This Round Robin (RR) takes place in the New York-Pennsylvania area, using Microsoft default FS98 scenery and Justin Tyme's DLMRVA31.ZIP (scenery of Delaware, Maryland and Virginia). I flew an MD80 on this trip, which is best suited for a commuter airplane or a medium jet. Though I used Microsoft's Flight Simulator 98, this RR can be flown with any flight sim that has the required airports and nav aids. The RRs use real-world navigation. If you have flown previous RRs, skip the next paragraph, jump right in, and have fun.

For those who are new to this, Round Robins are published so flight simmers can fly, explore scenery, refresh geographic knowledge, practice cross-country navigation, perform approaches at airports all over the world, and most importantly: have fun. You will be given information such as airport departure and runway numbers, VORs and NDBs enroute, two or three middle airport destinations (for VFR or INST approach) and instructions for returning to your point of departure (hence the name: "Round Robin"). You will be given ILS and LOM frequencies, minimums, procedures, etc. You will also get background on the geography of the area. After you fly a few of these, you will have a much better understanding of the different published procedures. You will learn to handle a lot of information in a very short time, while still maintaining control of your aircraft.

Route

New York's La Guardia to
Atlantic City, NJ to Baltimore,
MD to Philadelphia, PA back to
La Guardia

I also suggest that you read the entire route a couple times before starting so you'll have the flight plan fairly clear in your mind.

Required Scenery

➤ Microsoft Flight Simulator 98 default scenery, with USNE booster files available.

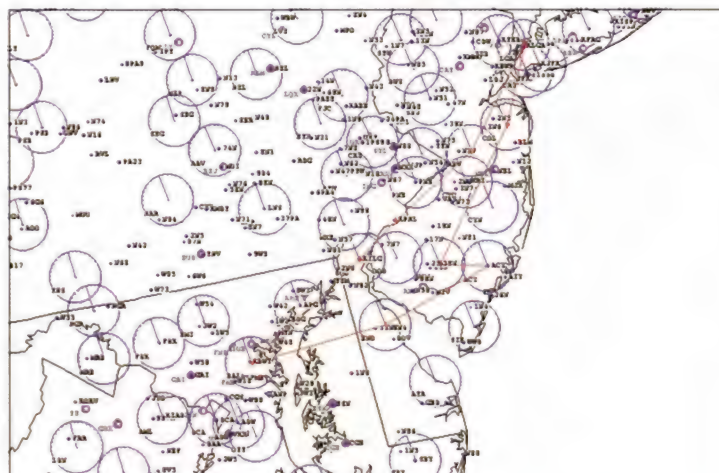
➤ DLMRVA31.ZIP (optional), which can be found at <http://www.fsgenesi.com/> and most flight sim Web sites.

NOTE: This flight can be flown with just the default scenery in FS98, but is greatly enhanced with the DLMRVA add-on scenery.

CoPilot - [Flight Plan1]						
File Edit View Navigation Window Help						
Waypoint	ID	Elev	Position	To Next	Waypoint	
	Freq			Course	Distance	Comments
La Guardia	KLGA	20	N 40° 46.6'	205T	30.9 nm	VOR LGA 113.10
	127.05		W 73° 52.2'	218M		
COLTS NECK	COL	121	N 40° 18.7'	219T	59.4 nm	
VOR	115.40		W 74° 09.6'	231M	30.9 nm	
CEDAR LAKE	VCN	121	N 39° 32.3'	105T	18.7 nm	
VOR	115.20		W 74° 58.0'	117M	90.3 nm	
ATLANTIC CITY	ACY	69	N 39° 27.4'	063T	0.1 nm	
VOR	108.60		W 74° 34.6'	074M	109.0 nm	
Atlantic City International	ACY	75	N 39° 27.4'	253T	45.7 nm	VOR ACY 108.60
			W 74° 34.5'	264M	109.1 nm	
SHYRNA	ENO	10	N 39° 13.9'	267T	53.4 nm	
VOR	111.40		W 75° 30.9'	277M	154.7 nm	
BALTIMORE	BAL	141	N 39° 10.3'	298T	0.5 nm	
VOR	115.10		W 76° 39.7'	308M	208.2 nm	
Baltimore	KBWI	144	N 39° 10.5'	058T	57.8 nm	VOR BAL 115.10
Washington Intl	127.80		W 76° 40.3'	068M	208.7 nm	
New Castle County	KILG	79	N 39° 40.7'	055T	20.2 nm	VOR DQO 114.00
	123.95		W 75° 36.5'	066M	266.5 nm	
Philadelphia Intl	KPHL	20	N 39° 52.4'	060T	39.8 nm	
	133.40		W 75° 14.9'	072M	286.7 nm	
ROBBINSVILLE	RBV	249	N 40° 12.1'	039T	45.1 nm	
VOR	113.80		W 74° 29.7'	052M	326.6 nm	
LA GUARDIA	LGA	10	N 40° 47.0'	196T	0.4 nm	
VOR	113.10		W 73° 52.1'	209M	371.7 nm	
La Guardia	KLGA	20	N 40° 46.6'			VOR LGA 113.10
	127.05		W 73° 52.2'		372.1 nm	

(Above) Flight Plan
prepared by
CoPilot.

(Right) CoPilot
map of flight plan.





Guardia Airport, both of which are located in the borough of Queens. Newark (NJ) International Airport supplements them.

For the experienced flyers: please be patient through all of the explanations, directions and extras. I direct this at newcomers to the flying world, so I must stick to plain language.

Have fun!

Begin

First Leg

From: LaGuardia (LGA)

To: Atlantic City (ACY)

Distance: 105 nm

- ✈ Set the FS clock to 1400 in the **World | Time & Season...** menu. Set the weather to CAVU (Ceiling And Visibility Unlimited) in the **World | Weather...** menu.

- ✈ Click **World** | **Go to** |
Airport... and select La
Guardia, Runway
(RWY) 22
(ATIS127.05).

Dial in the COLTS
NECK (COL) VOR
115.40 on NAV 2 and the
LOC (I-PVO) 109.1 on
NAV 1.

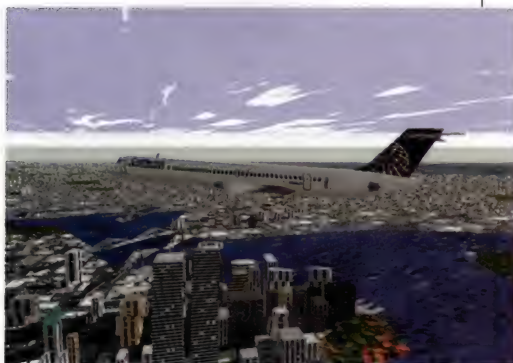


This flight will take you across the mid-Atlantic seaboard, over Delaware Bay and Chesapeake Bay.

Philadelphia, the largest city in Pennsylvania and the fifth largest in the United States, is situated in southeastern Pennsylvania on the West Bank of the Delaware River. The city is about 160 km (100 mi.) north of where the Delaware River empties into Delaware Bay. Philadelphia gets its name from two Greek words meaning "city of brotherly love."

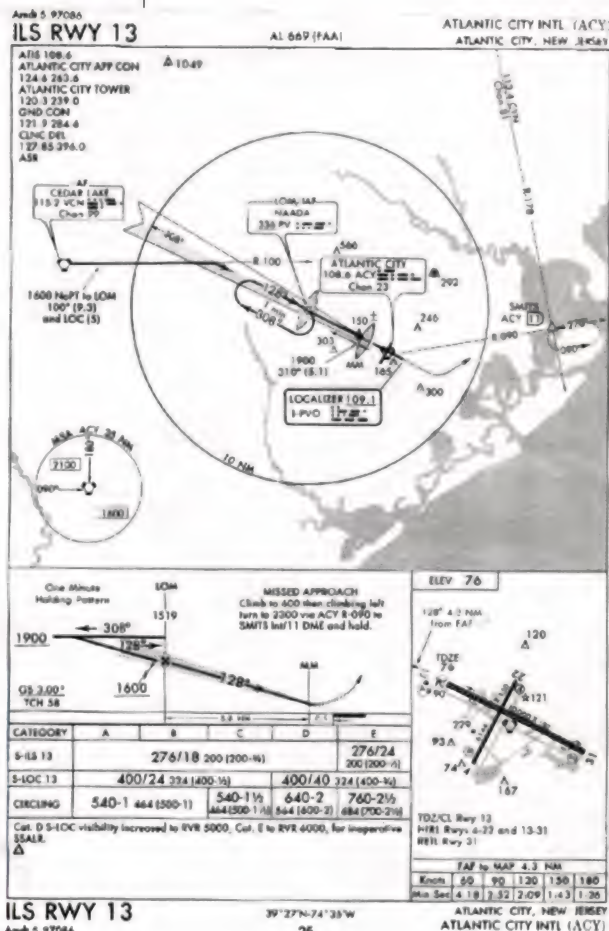
Baltimore/Washington International Airport (BWI), situated just south of the city of Baltimore, is the major air hub for the entire Baltimore, Maryland, Washington D.C. metro area. Washington National Airport (DCA) supplements BWI with domestic air travel.

New York City's major air-transportation facilities are the John F. Kennedy International Airport and La

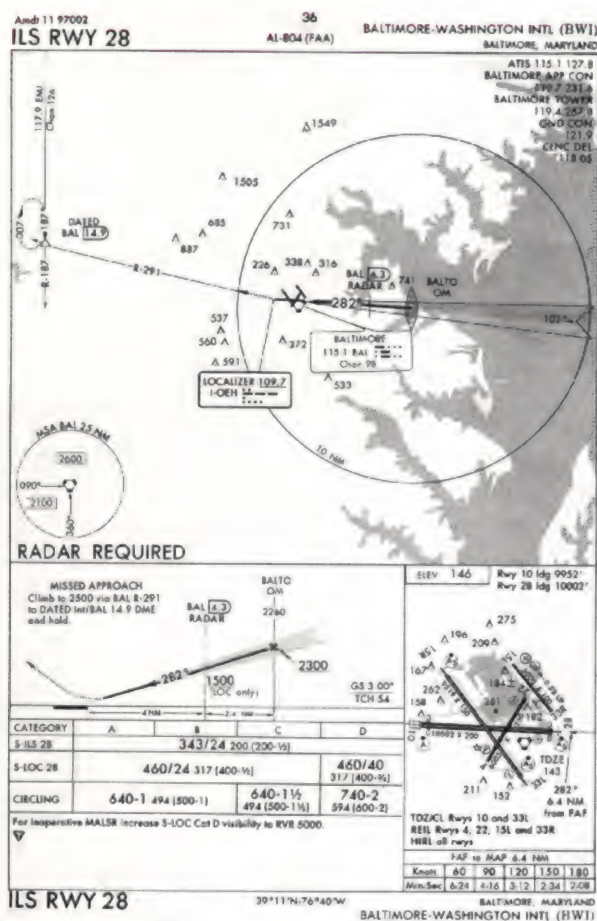


*(Left) My MD 80
climbing over New York
City.*

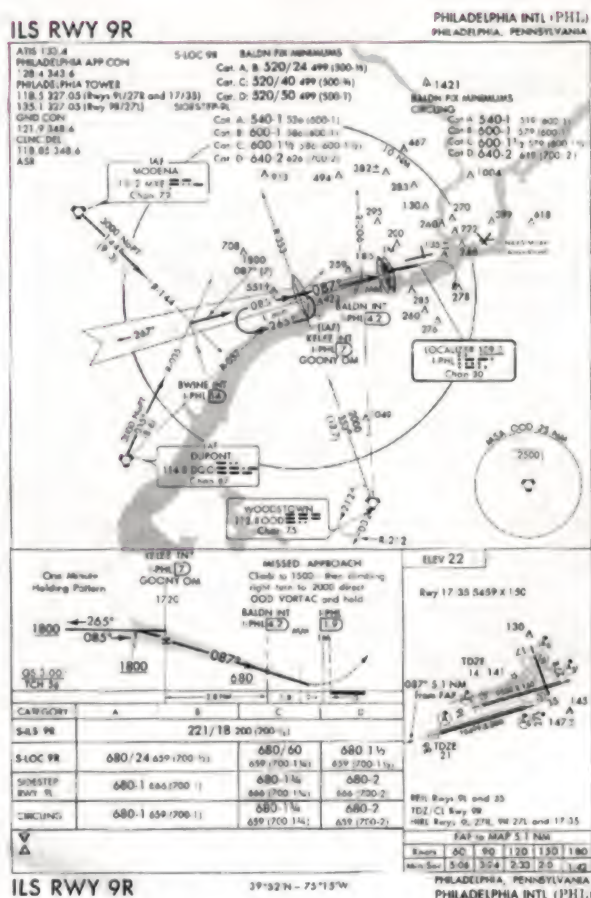
(Right) IAP for ACY
Atlantic City.



A Round Robin Adventure



IAP for BWI Baltimore/Washington International Airport.



IAP for PHL Philadelphia International Airport.

- ✈ 5 nm back, you are cleared for a full stop to RWY13—make sure your gear is down.

Land Atlantic City

Second Leg

From: Atlantic City (ACY)

To: Baltimore -Washington INTL
(BWI)

Distance: 100 nm

- ✈ Set the clock to 1500 and the season to winter. Atlantic City ATIS 108.6.
- ✈ Dial in the SMYRNA (ENO) VOR 111.4 on NAV 2, the LOC (I-OEH) 109.7 on NAV 1, and set course 282 on your OBI.

- ✈ Taxi to and T/O RWY 31, perform a left climbing turn to 21,000, track the ENO VOR to on top (approx. HDG 258M).
- ✈ Over ENO, dial in and track the BALTIMORE (BAL) VOR 115.1.
- ✈ 30 nm from BAL, begin a descent to 6,000 in preparation for an ILS to RWY 28 (actual course is 282, elevation 146, RWY length 10,500).
- ✈ 24 nm from BAL, turn left to HDG 265 to intercept the LOC, and proceed with the approach.
- ✈ 5 nm back, you are cleared for a full stop to RWY 28L. Check the gear is down.

LAND Baltimore-Washington

Third Leg

From: Baltimore Washington

To: Philadelphia Intl. (KPHL)

Distance: 77 nm

- ✈ Set the clock to 1700 and the season to winter. Baltimore ATIS 115.1.
 - ✈ Edit Weather to Cloud Base 3,900, Tops 11,000, Broken 5/8 and Visibility 4 miles.
- NOTE:** This weather will give you fantastic effects on short final at Philadelphia and La Guardia.
- ✈ Dial in the DUPONT (DQO) VOR 114.0 on NAV2 and the LOC (I-PHL) 109.3 on NAV 1, and set 087 on your OBI.

- ✈ Taxi to and T/O RW 10, make a left climbing turn to 18,000, and track the DQO VOR (approx. HDG 068) to on top.
- ✈ 10 nm from DQO, begin descending to 9,000. Over DQO, turn left HDG 035 to intercept the LOC and continue descending to 5,000 in preparation for an ILS to RWY 09R (actual course 087, elevation 22, RWY length 10,500).
- ✈ Intercept the LOC, and proceed with the approach.
- ✈ 5 nm back, you are cleared for a full stop to RWY 09R. Be sure the gear is down.

LAND Philadelphia



Night Approach to KPHL Philadelphia International Airport.

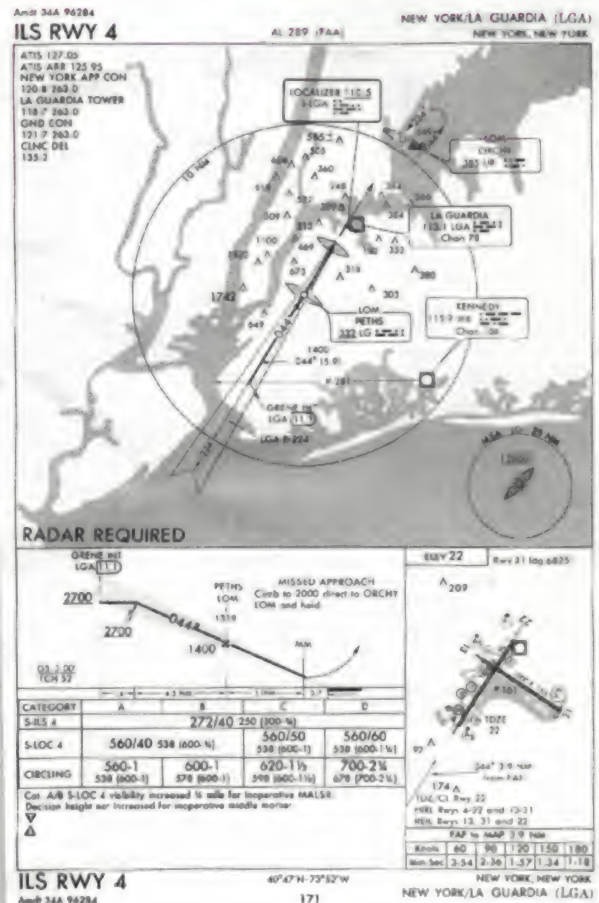
Fourth Leg

From: Philadelphia

To: New York's La Guardia

Distance: 85 nm

- ✈ Set the clock to 1900. Philadelphia ATIS 133.4.
- ✈ Dial in the ROBINSVILLE (RBV) VOR 113.8 on NAV2, the LOC (I-LGA) 110.5 and the LOM PETHS (LG) freq. 332.
- ✈ Taxi back to RWY 09R. T/O, climb RWY HDG to 2,500, then turn left and track the RBV VOR (approx. HDG 072), and continue climbing to 18,000.
- ✈ Over RBV, dial in and track the La Guardia (LGA) VOR 113.1.
- ✈ 30 nm out, begin a descent to 7,000 in preparation for an ILS to RWY 04 (actual course 044 Elevation 22, RWY length 7,000).
- ✈ Intercept the LOC, and proceed with the ILS approach.
- ✈ 5 nm back, you are cleared for a full stop to RWY 04. Be sure your gear is down.



IAP for LGA La Guardia Airport.

LAND La Guardia

Welcome home!

Thank you to Chris Squire and Ron Brown for test flying the route. Also, thanks to Peter Jacobson for CoPilot, which was used for flight planning and maps.

Many thanks to Justin Tyme for the fantastic scenery. After you fly this Round Robin, I urge you to fly to the many airports in the DLMRVA31.ZIP, available at Justin's home page: <http://www.fsgenesis.com/>.

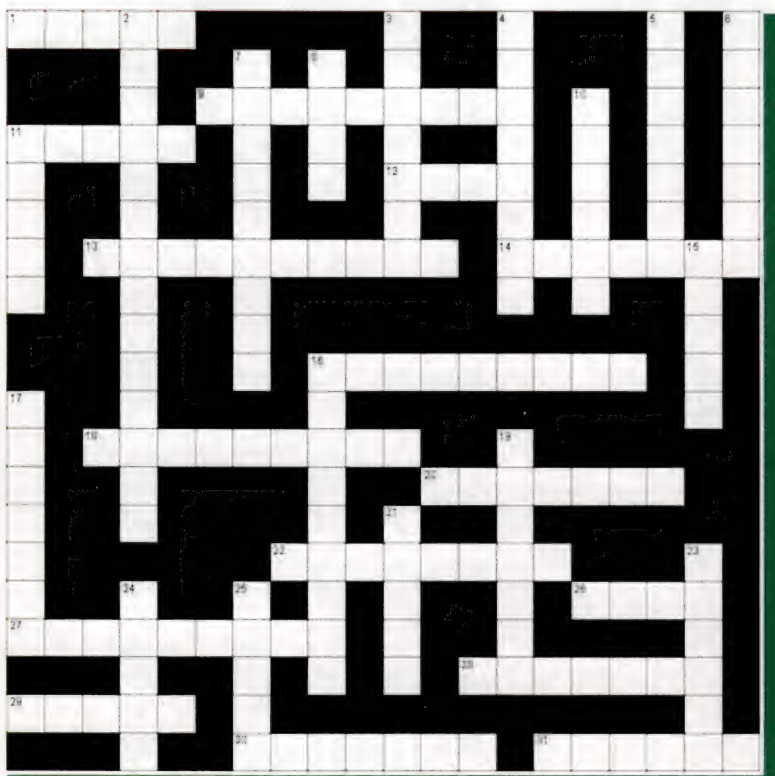
I flew the new MD80 by Mike Vidal, which you can download at: ftp://wings.ark.com/wings/fs98/aircraft/md90_98.zip, with the excellent MD80 panel by Matt Frischmann, available at <ftp://wings.ark.com/wings/fs98/panels/md8x.zip>.

Visit Al Pelletier and his crew at:

<http://www.wings.ark.com>

apeltier@mars.ark.com

CROSSWINDS



This crossword features FS oriented terms and, unless you're a pilot, rates high on the difficulty scale (at least around our office). If you become fogbound, navigate to page 32 for the answers. Enjoy!

Across

1. Name of a static object placed by scenery design programs.
9. Part of a plane driven by the engine that allows planes to move.
11. Displays gauges to assist with flight, navigation and communication.
12. First part of the plane to touch the ground.
13. A part of the panel the refers to one aspect of the flight, navigation or communication.
14. The first menu in FS98.
16. FS's sailplane.
18. A preset circumstance access or pre-arranged flight.
20. What you see looking out the cockpit.
22. Your elevation above sea level.

26. The front of the aircraft.
27. The landing of an aircraft.
28. A menu in FS98.
29. abr. A compiler/assembler for Flight Simulator scenery files.
30. Scenery in motion is often called _____ Scenery.
31. The new Flight Simulator by Microsoft being released this fall.

Down

2. Objects in FS are drawn in relation to this; Defines a Latitude and Longitude position. a scale factor and visibility value.
3. A 2 dimensional object in FS, usually drawn parallel with the ground
4. A menu in FS.
5. The old prop bi-plane in FS.

6. Used to find direction; usually a separate view of the Instrument panel in FS.
7. A factor used to determine how many times the screen is drawn per second in FS.
8. One view in FS selected by the 'S' key or from the Views menu.
10. Objects in FS that do not move are called _____ Scenery.
11. High quality scenery texturing is called _____-realistic.
15. One view in FS selected by the 'S' key or from the Views menu.
16. A plane in FS98 that has no self propulsion.
17. The smaller jet in FS.
19. A common type of instrument panel for a lot of aircraft - typically military; _____ Display
21. 'VID' is the extension given to these files in FS.
23. The most common plane in FS.
24. abr. A compiler/assembler for Flight Simulator scenery files.
25. A menu in FS98.



How I Make Scenery

Part V: Natural Geographic Features

By Justin Tyme

Justin Tyme continues his series on scenery design. Natural geographic features have the potential to significantly enhance the realism of the simulation experience, especially for those simmers that are also real-world pilots. The closer to reality we can make the scenery, the more satisfying the experience will be for the simulator pilot.

Continuing our analogy of the previous four installments, now that we have laid the foundation, built a framework and begun to apply the siding, we are ready to continue with more landscaping. Natural geographic features have the potential to significantly enhance the realism of the simulation experience, especially for those simmers that are also real-world pilots. Accurately placed mountains, rivers and coastlines can contribute greatly to the “willing suspension of disbelief,” which is the goal of all good fiction, as well as the goal of any simulation. The closer to reality we can make the scenery, the more satisfying the experience will be for the simulator pilot.

We will consult two reference sources mentioned in previous installments for the scenery elements in this article. The Delorme 3-D Explorer is very useful for a good overall impression of terrain and land-use features. Before tackling an area, I like to first “fly” around in 3-D Explorer to get a “feel” for the region. Delorme has also just released a product called Topo USA that is sure to become my reference source of choice. Topo USA is, as the name implies, a topographic map of the entire United States, including land-use information. Topo USA combines the functions of 3-D Explorer and my other favorite geographic reference source, the Atlas & Gazetteer Series.

Synthetic Scenery and Land Use

First, let's grab the Atlas & Gazetteer for the area we're working on. You will notice that forested areas are represented with green, while the plain white areas indicate farmland or prairie. The default synthetic textures are in most cases inadequate for our goal of realism, so you may want to create your own textures using Paint Shop Pro, as described by Eric Mitchell in the June/July '98 issue.



Figure 1



Figure 3

If you are using your custom textures as polygons, you can name them anything you want, but it's a good idea to keep the name unique so during installation it doesn't unintentionally overwrite a different texture of the same name by a different author.

If you want to use your custom textures as synthetic tiles, you must name them “seed*.r8,” where “*” is an available hex number between 1-255. Here, too, we must be careful, as there are only 256 available hex numbers to use as synthetic textures, and many of these are already taken by the default textures and others created by various authors. The only database I am aware of that lists existing seed textures and available hex numbers is located at <http://www.avsim.com>. It's always a good idea to consult this texture database before naming any custom synthetic textures. Since synthetic seed textures must be in the main FS texture directory, there is a danger of overwriting an existing seed texture

and completely altering the intended appearance of any (or every) installed scenery. So be very, very careful when naming your custom seed textures.

I found the default synthetic textures inadequate for my Pennsylvania scenery, so I used Paint Shop Pro to combine three or four different textures into one custom texture that fairly accurately represented the general land-use characteristics of the region.



Seed19.r8

You can create a variety of seed textures necessary for your particular needs. The only limit is the availability of hex numbers.

Our objective is now to transfer the information found in the reference source, in this case the Delorme Atlas & Gazetteer, into your ASD .SCB file. Since we should have already placed our synthetic tiles with their proper elevations much earlier in the project, it is now simply a matter of right-clicking on the tile and choosing **Properties** to assign the appropriate synthetic texture. Do this throughout your scenery area until you have covered the whole area with accurate ground textures.

To avoid a "blocky" appearance, you may want to add some irregular polygons of similar textures in various places over the tile boundaries.

Lakes, Rivers & Streams

ASD makes this part fairly easy, since it has already placed most of the rivers and streams for you. But it has made them the default widths and styles that you specified in the **File | Preferences** dialog box. Therefore, some editing and customization is necessary.

First, let's take a look at a special scenario. You have a major river. It's wide and has an irregular shape. The default ASD .SCB file only recognizes the shores of the river, and we want to fill it in. For example, in the default Washington/Oregon map, you will notice how ASD interprets the Columbia River near Wallula. We see each shore interpreted as a river.



Figure 4

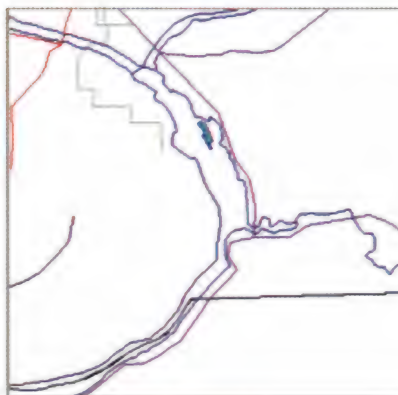


Figure 5

So, we need to somehow tell ASD to fill in this area, as seen from the Delorme Street Atlas image in Figure 4. To do this, we first have to combine the two shores into one region, so let's do some editing. Right-click on the river region representing the western shores and chose **Edit** (Figure 6). Now, we're going to split this region at a logical point. Zoom in, place your mouse cursor on one of the handles and press the **S** key while clicking the left mouse button. The result is shown in Figure 7. In this particular example, no editing is required on the eastern shore, but in most cases you will similarly edit the other shore and generally prepare the multiple regions for joining.



Figure 6

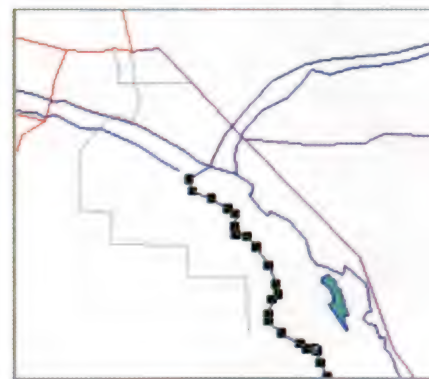


Figure 7



Figure 9

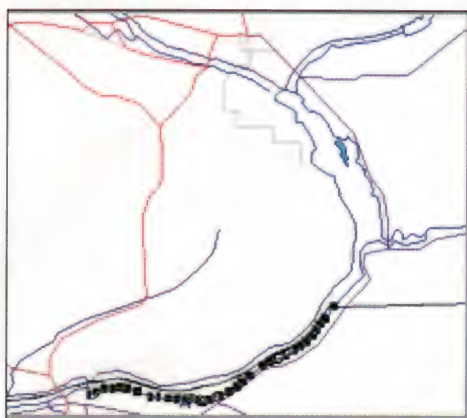


Figure 10

After the necessary splitting, we now have five different river regions, which we are going to join into one region. We do this by selecting one of the regions. It will turn green. Now select an adjacent region. It will also turn green. Make sure these are the only two regions on your map that are selected. Pull down the **Edit** menu and choose **Join**. These two regions are now joined into one. Now select the next adjoining region. Pull down the **Edit** menu and choose **Join** again. Do this until all five river regions are joined into one. Now it's just a matter of right-clicking on the new, unified region and choosing **Properties**. Under the Region tab, choose **Lake**. The result is shown in Figure 11.



Figure 11

Other attributes ASD can assign to rivers include smooth bends, reverse river course and tapered. Generally, you should have smooth bends turned on under the global **File | Preferences** menu. The reverse river course

and tapered attributes are used in special circumstances that will be explained a bit later.

First, though, we should do some joining. Since we'll be working only with river regions, you should pull down the **Display** menu and turn everything off but **Hydrography**. This will eliminate much of the clutter in your map. Using your reference source, determine which rivers in your ASD map will need to be joined. The reasons for this will become apparent in a moment. Let's return to the Oregon map and follow a river from its source to its mouth—Rock Creek, in north-central Oregon.

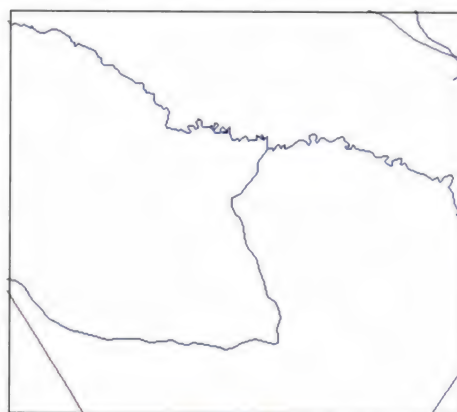


Figure 12

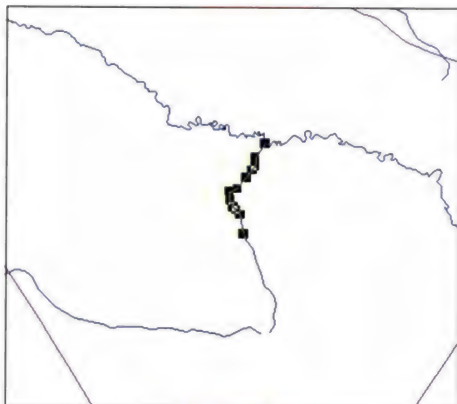


Figure 13

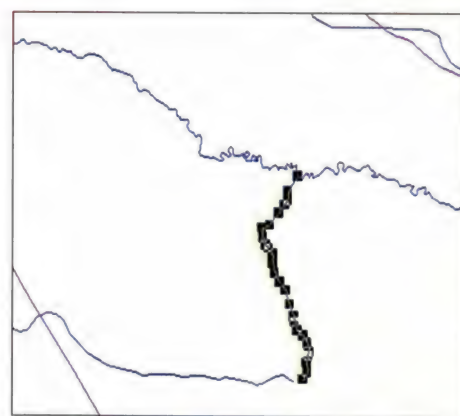


Figure 14

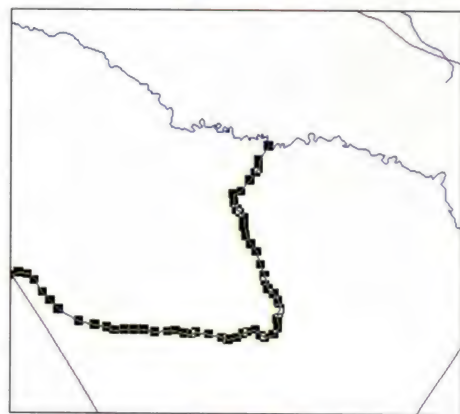


Figure 15

You can see in Figures 13 & 14 that this river is divided into several segments by default. We want to combine all these sections into one region, using much the same method we used earlier with the Columbia River. Starting at the mouth of the river, select the first two segments, pull down the **Edit** menu and choose **Join**. These two segments are now joined into one region.

Select the next segment, pull down the **Edit** menu and choose **Join** again. Continue this until all segments of the river are joined into one. The result is shown in Figure 15.

Looking at our reference source, we can estimate that Rock Creek is about 300 meters wide at its mouth. We will also assume that it is about 10 meters wide at its source. Now we right-click on Rock Creek and choose **Properties**. Under the **Style** tab, enter "300" as the **Maximum Width** and "10" as the **Minimum Width**. Click **OK**.

Uh-oh—selecting the river reveals that ASD has made the mouth 10 meters and the source 300 meters wide. Sometimes ASD does this. It's no problem. Return to the



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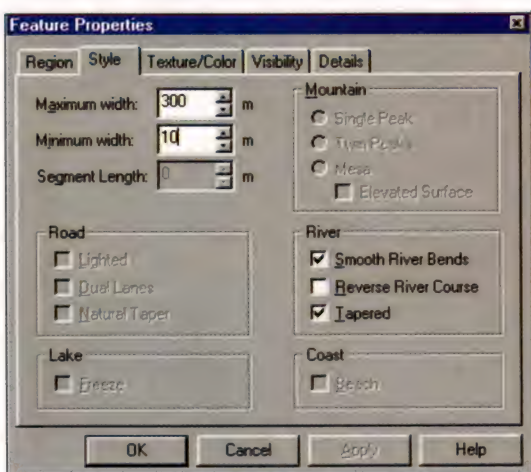


Figure 16

Properties dialog box Style tab again and put a checkmark beside Reverse River Course. Now the mouth is 300 meters and the source is 10 meters, as it should be.

By first joining all the sections, we have allowed ASD to gradually taper the whole length of Rock Creek from 300 meters at its mouth to just 10 meters at its source. Had we not joined all the segments, each segment would have been tapered, making for a very unusual—and unrealistic—effect.

Most major rivers and even minor ones will have several tributaries. Once you have joined all the segments of the main artery and tapered it, you can go back through and adjust the Style

Properties of the tributaries to reflect realistic values. Use your reference source where possible to estimate the mouth and source widths, join where necessary, taper, and check to ensure that ASD has chosen the correct tapering course.

Next time we'll cover mountains and coastlines. Happy building!



Virtual Flight Training: NDB Navigation

By David Lewis

This column looks at the development of navigation and flight planning, from the earliest days of biplanes with road maps in the cockpit to the latest jet airways. Detours along the way will explore various aspects of aviation, including charts, weather and controlled airspace, with exercises for you to practise on your simulator. By the end of the journey you should be able to find your way safely from A to B in the virtual world of FS 98.

In the last issue, we started using the ADF to find our way around California, in addition to using dead reckoning and landmarks. In this issue, we'll look at ADF and wind drift, flying away from an NDB, and flying at night.

One of the great things about a radio aid like ADF is that it helps you correct for wind drift. If the wind blows you off course to the left, the needle automatically swings round to the right, and you correct. The danger is that the wind will blow you further to the left, and you'll correct some more, and so on, until you're facing straight into the wind when you finally reach the beacon. This is wasteful and can be dangerous (if several aircraft are approaching the same beacon).

The alternative approach is to over-correct. If the ADF needle swings to the left by five degrees, turn left ten degrees. The needle will point five degrees right of center. Maintain that heading. If you're lucky, you will have turned the nose into the wind enough so that you will maintain a direct course to the ADF (see Figure 1).

After you over-correct, fly straight for a while and watch the ADF needle. If it stays still (five degrees right in this case), then you're spot on. If it drifts back toward center, then you haven't corrected enough and need to turn left some more. If it drifts away from center, then you've corrected too much and need to turn right a little. You can practice this in the next flight.

Now let's look at flying away from an NDB. When approaching an NDB, the ADF needle points straight at the beacon. The same thing happens when flying away from it, so the needle points straight down. If you fly west from a beacon, the needle points straight down, and if you fly east, it still points straight down. This tells you nothing about your heading (see Figure 2).

What use is an ADF when you're flying away from an NDB? Well, you can still use it to correct for wind drift. Let's suppose you want to fly away from an NDB on a course of 090 degrees. So, you steer 090 by the compass and watch the ADF point straight down. The wind is from the north, and after a while the ADF needle starts to point left. Now you know to turn left (and over-correct) to find a heading where the ADF needle will be stable (see Figure 3).

This time the rule is reversed: if the needle turns toward the center, then you've corrected too much and need to back off a little; if the needle continues to move away from the center, then you need to correct a bit more.

This next flight will be partly at night. This means you won't be able to see the ground (obviously), so you'll be flying by instruments. The crucial instrument is the artificial horizon, which shows you which

way is up. This is divided into a brown half (the ground, hopefully at the bottom of the gauge) and a blue half (the sky). Try it in daylight. Notice how the line moves up and down as you raise and lower the nose of the aircraft and how it rolls when the aircraft rolls. Basically, it's like watching the real horizon.

The other critical instrument to watch at night is the altimeter. Since you can't see the ground, you may not realise how close it is!

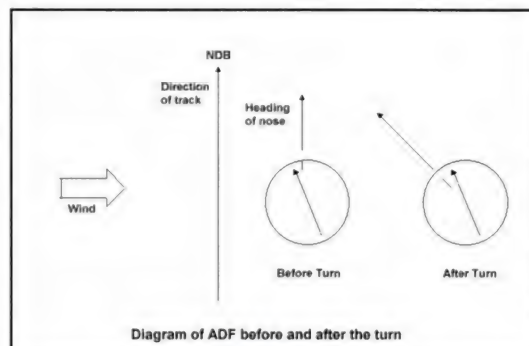


Figure 1

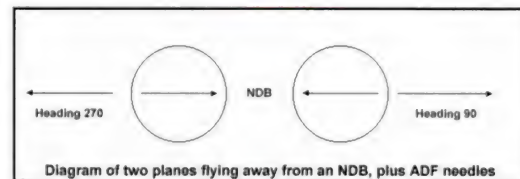


Figure 2

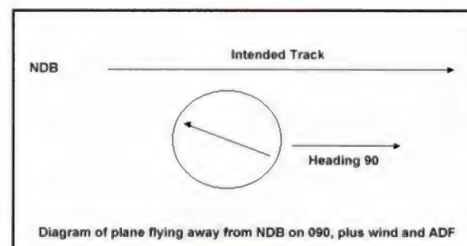


Figure 3



Figure 4: Salinas runway 26 at dusk.

Flight No. 5: Salinas Municipal to San Jose International

Start FS 98, and select runway 26 at Salinas Municipal, in the San Francisco. Set the time to Dusk, and select the Cessna 182 RG. Leave the weather as normal.



Figure 5 (above) San Jose International Airport.

Figure 6 (right) On final approach to runway 12R.

Before take-off, tune in Pajar NDB on the ADF. The frequency is 327. At 400', turn toward the NDB and note your heading. That is the course you want to fly all the way, so correct for wind drift as you go. Climb out to 5,000', and stay at that altitude the whole way (see Figure 4).

Obviously, I don't know your cruise speed, but assuming 120 kts, you should reach Pajar in nine minutes. Now fly away from Pajar on a heading of 333M for a distance of 28 nm to reach San Jose. If you drift off track, correct so that you actually follow a track of 333 degrees magnetic from Pajar NDB.

When you arrive, the airport will be lit up, and you can see the runway configuration. It's quite distinctive, with one long runway in the middle (12R) and two shorter ones almost parallel on either side of it (12L and 11). I recommend the long runway for this landing (see Figure 5 and Figure 6).

As you line up for the approach, pause and take a look at the lights. All three runways have high-intensity white lights along the runway edge. They all have green lights across the near end and red across the far end (REIL, Runway Edge Identification Lights).

Runway 12R, in the middle, also has a line of lights leading up to the near end. There is a running dot pattern for 2,000', followed by sidebars, then a further 1,000' of lights to the runway threshold.

Runway 12L on the left has two "dashes" to the right-hand side, Runway 12R has three and 11 has three on the left. These are VASI, or Visual Approach Slope Indicators. They tell you whether you are too high or too low on the approach.

The two-bar VASI on 12L is easier to explain. If both bars are white, you are too high. If both bars are red, you are too low. If the top is red and the bottom is white, you are right on (see Figure 7).

Three bar VASI is designed for big jets, where the pilot sits so far in front of the wheels that he has to land halfway down the runway when the main wheels touch down on the threshold. For normal aircraft, use the bottom two bars, and treat it like a two-bar VASI. For 747s and the like, use the top pair of bars. What a clever invention!

So, watch for two reds and a white all the way in, and make a perfect landing. If you're not sure when to expect the bump of hitting the runway, you need to know it's at 62' above mean sea level (AMSL). We'll look at measures of height later, when we get into the airways.

If you have trouble flying away from Pajar accurately for the 14 minutes it should take, and you get lost, retune your ADF to Jorge NDB on 249, which should be right by San Jose airport, and fly in directly.





VFR/IFR

VFR and IFR stand for Visual Flight Rules and Instrument Flight Rules. They are the two sets of rules by which you have to fly, and which one applies depends on the conditions. The rules include things like at what altitude you should fly, depending on your heading. In the US, the rule for VFR is eastbound aircraft (course 000 to 179 degrees magnetic) fly at an odd thousand feet + 500' (e.g., 7,500' or 9,500') and westbound at an even thousand plus 500' (e.g., 6,500' or 8,500'). That way, eastbound traffic is at a different height from westbound traffic, and they shouldn't be able to collide head-on.

When the sky is clear and you can see all the way to your destination, you have Visual Meteorological Conditions (VMC). When the clouds are so low you can't see the roof of your house, and it's raining stair rods, then you have Instrument Meteorological Conditions (IMC). In VMC you can fly safely just by looking out of the windows. In IMC you have to use instruments, and you must have passed a test and have an IFR rating on your licence.

Obviously, someone has to define good weather / bad weather, so there are no arguments when it's on the borderline. They also decided to confuse matters, by having different rules depending on the class of airspace you fly through. Maybe five miles visibility is enough to avoid a flock of geese or a mountain, but it doesn't give you much reaction time when a 737 is bearing down on you at 250 knots. You get about a minute to get out of that 737's way, unless of course you're doing 250 knots as well, head to head, when you get to play chicken for all of 36 seconds before the crunch comes. So the visibility has to be a little better before they

let you fly anywhere around the big jets, and a lot of the jet airways are strictly for instrument flying only.

The US rules for VMC in uncontrolled airspace are:

- ✈ Up to 1,200' above ground, visibility of one statute mile and keep out of clouds.
- ✈ Up to 10,000' above sea level, visibility of one statute mile, 500' below cloud or 1,000' above cloud and 2,000' horizontally away from clouds.

- ✈ Over 10,000' above sea level, visibility of five statute miles, 1,000' above or below cloud and one mile horizontally away from clouds.

In the UK, we don't have as much uncontrolled airspace, but the rules for anywhere that VFR is permitted are:

- ✈ Up to 3,000' above ground, visibility of five km and keep out of clouds
- ✈ Up to 10,000' above sea level, visibility of five km, 1,000' above or below cloud and 1,500 m horizontally away from clouds.
- ✈ Over 10,000' above sea level, visibility of eight km, 1,000' above or below cloud and 1,500 m horizontally away from clouds.

The two are not very different, really. VFR applies in VMC, provided you are in appropriate airspace; otherwise IFR applies, and the aircraft must have the right equipment and the pilot must be qualified. Night flying is treated as a special kind of VFR, except in IMC at night (cloud, rain, etc.).

Tall Tales from the Pilots' Lounge

Short Circuits

It was all Phil's fault really. We were chatting generally about flying the circuit at our local field, and he asked, "How long does it take?" I didn't understand at first, so he explained. "I was just thinking about how many hours I've spent going round in circles when I could have been going someplace."

Phil's like that, always in a hurry. He never can understand why the British seem content to wait our turn in a queue.

The conversation drifted onto other things. We were just discussing the near-closure of Chicago's Meigs Field, when Phil made a connection. "That would be a great place to find out just how fast that circuit can be." His eyes had a sparkle, and they were clearly focused on somewhere a lot further away than the wall of the bar. I knew for sure that he would have to see this through.

There can hardly be a pilot (or simulator pilot) who hasn't spent hours flying standard circuits. You line up the plane on the runway, give it full throttle, release the handbrake, and go. Watch for the speed to reach V_r , and press back gently on the stick. As soon as you're off the ground, pull up the wheels. Wait. At 400' above ground, you're clear of any turbulence around buildings and hills, so raise the flaps if they're down, and turn left 90 degrees onto the "crosswind" leg. Keep climbing. When you reach 800' AGL it's left again and level off for the downwind leg.

Actually, this is a point of long discussion between Phil and me. In the States everyone is expected to fly the same length of leg—half a mile straight out, half a mile crosswind, downwind to half a mile past the runway end, half a mile base and half a mile finals. In the UK we are more tolerant of pilots who want a bit more room than that, and quite often fly wide patterns. Obviously everyone else also gets to fly wide, to maintain the separation. Phil gets most annoyed at having to keep going for a whole mile downwind before turning base, and usually calls in "Cessna Four Eight Uniform Heavy turning finals to land."

So the quiet circuit pattern over Meigs was like an open invitation to Phil to see how tight he could turn, and how fast he could get round. It was a challenge he could hardly resist, and I must confess I was keen to have a go as well. Between us we drew up some rules for the contest:

1. The contest is a straight race, for the fastest time from take-off to landing on Meigs runway 36. Timing begins when the wheels leave the ground, and ends when the aircraft comes to a stop again.
2. All pilots will act responsibly and not be a danger to anyone (except perhaps themselves).

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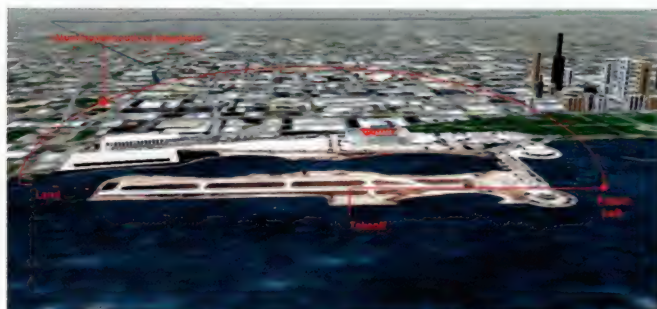
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back issues and other information and files that
are available on the website.



- Choice of aircraft is at each pilot's discretion. We couldn't even agree whether a more powerful aircraft would give a faster circuit or just force a wider turn. We did rule out helicopters, of course!
- Lifting off and putting straight back down doesn't count. The aircraft must at some point in the circuit be South of the threshold of runway 36 (see Figure 8).

That's all we could agree on. The weather was out of our control (and does it matter anyway?), and we couldn't think of a rule to cover fuel load. I won't mention the result—there are limits to being a good loser. But it may be that one of you could do better. To help you with the timing and such, I've written a short adventure program. At take-off it calls "One," when you pass south of the threshold it calls "Two," and when you come to a stop it displays your total time (in seconds).

```
TITLE "Short Circuits"
DESCRIPTION "Short Circuits"
V=VELOCITY
WHILE ON_GROUND
ENDWHILE
S = (HOUR*3600)+(MINUTE*60)+SECOND
PLAY "FS_1.WAV"
WHILE PLANE_LAT > 41:51:12
ENDWHILE
PLAY "FS_2.WAV"
WHILE VELOCITY>V
ENDWHILE
PRINT (HOUR*3600)+(MINUTE*60)+SECOND-S
WAIT 5
```

If you have an APL compiler, you should be able to key this into a text file, run APLC on it to create an .ADV file, and select that within your version of Flight Simulator. Why is it that getting the adventure to run seems harder work than writing it in the first place?

As a final note, remember that this is an exercise for flight simulators, and not for the real thing. As the saying goes, "There are old pilots and there are bold pilots, but there are no old, bold pilots."

Happy flying!



The Latest In Flight Simulation

The MicroWings Conference

By Arnie Lee

MicroWings is officially known as *The International Association for Aerospace Simulations*. That's a mouth full, but organizer and President Robert Mackay likes to refer to the **MicroWings Conference** as "flight sim heaven". He works hard to bring together a very dedicated group of flight sim enthusiasts, software and book publishers and industry notables. He arranges the conferences near an attractive metropolitan area with plenty of sightseeing geared to aviation buffs and holds it at a modern, convenient conference site.

This year's **MicroWings Conference** took place in Orlando, Florida. For me, Orlando is usually a fun place to visit. It's home to Disney World, Universal Studio, Sea World and many other family attractions. But the weather in August 20th to 23rd was a little on the "toasty" side. The day before the conference started, we visited Disney's new Animal Kingdom. Our visit to the animals was short-lived; the excruciating heat and humidity compelled us to leave the park by noon.

Luckily, the air-conditioned facilities at the Clarion Plaza Hotel conference site made Orlando much more tolerable. Despite the intense summer heat, hundreds of flight sim enthusiasts arrived at the conference. Some traveled literally half way around the world to attend. They came to hear about the upcoming developments in flight simulation and to meet and talk with major software companies, flight sim personalities and industry representatives.

The conference is organized around three major areas:

- ✈ Tours of various aviation facilities
- ✈ Presentations of products and flight sim techniques
- ✈ Exhibit hall with demos of flight sim products

This year there were tours of the Orlando Control Tower, Orlando Air Traffic Control Facility, Kennedy Space Center, SimCom – a major simulator training organization and the Flying Tigers Warbird Museum. Buses shuttled the attendees to the various places around the Orlando area to the tour locations – and yes, the buses were air-conditioned.

Several of the members who went on the tours told me how interesting they were especially the Orlando tower and ATC which is one of the most modern of the FAA facilities. Another group who went to the warbirds museum were impressed with the arrangement.



And of course, there were those who flew in actual simulators having a white-knuckle experience at the SimCom facility, taking off and landing jumbo jets, airliners and the King Air twin.

Presentations

The presentations were held during the three mornings. The number and variety of presentations was large, but each talk was aimed at keeping the attendees in the flight sim spirit. Here's a list of the speakers and topics and where you can find additional information:

Highlights of the presentation

Aerosoft

Aerosoft is based in northern Germany and publishes a good number of flight sim add-ons. Marketing Director Richard Donaldson showed a new Aerosoft product that lets you design aircraft panels interactively. In his demo, he easily dragged and dropped new gauges onto an empty background and created his own customized panel. The product is tentatively called "Panel Maker" and will most likely have a price of about 69DM.



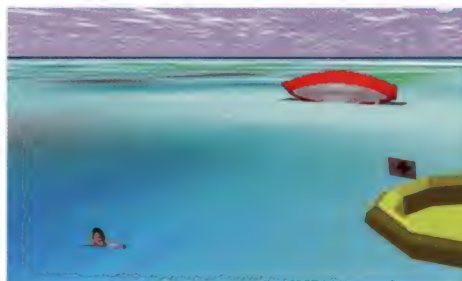
Company - Product	Speaker	For More Information
Dyamix - Pro Pilot 99	Phil Cowles	http://www.sierra.com
AETI - ProFlight 98	Tom Main	http://www.simpilot.com
Danur - CFS Tupelov 154	Urs Wildermuth	
Nomisssoft - Airline Simulator	Simon Hradecky	http://www.nomisssoft.com
Flight Safety International Aviator Pro 99	Jennifer Burghardt	http://www.flightsafety.com
Microsoft - Combat Flight Simulator	Jose Pinero	http://www.microsoft.com
Training Associates - Books for FS	Bill Stack	http://www.topskills.com
Northern Alberta Inst Tech. - Interactive Flight Training	Dave Heathcote	http://www.nait.ab.ca
Pilots - FS Global Scenery	Stefan Schaefer	http://www.austrodata.at/gbs
The Flight Crew - Publishing for Europe	Mungo Amyatt-Leir	http://www.flightsim.co.uk
Daniel Mass Simulations - 3D Graphics in Simulations	Dan Maas	http://www.dcline.com
Virtual Skunks - New Aircraft Technology	Craig Mosher	http://rampages.onramp.net/~tekmate/
AETI - Flyoff for Pentium 300 Computer	Marty Arant	http://www.simpilot.com
Aerosoft - Panel design	Richard Donaldson	http://www.aerosoft.com
Lago - New Add-ons	Ugo Grandolini	http://www.lagoononline.com
The Flight Crew - DC-3	Trev Morson	http://www.flightsim.co.uk
Black Box Test Facility	Geoffrey Campbell	http://www.geocities.com/CapeCanaveral/Launchpad/8410
Jeppesen - FlitePro	Mark McCabe	http://www.jeppesen
SimPilot Forum	Urs Wildermuth	
Looking Glass - Flights Unlimited III	Peter James	http://www.lglass.com
P&P - Mediterranean Coast Scenery	Andreas Piontek	
Laminar Research - X-Plane	Austin Meyer	http://www.x-plane.com
Desktop Wings - Conference Summary	Alfred Poor	http://www.design-web.com/DesktopWings

Lago

Ugo Grandolini demonstrated a new technology which Lago calls "active scenery". This is a clever way to make interactive sceneries. In the demo, Ugo showed a plane following a school of sea creatures. He reported whether they were harmless dolphins or dangerous sharks. At the end of the adventure, the flyer earns a score based on his piloting and observation skills. "Active scenery" will be part of their upcoming Bahamas scenery.



(Top image) From the air, it may be more difficult to distinguish the dolphins from the sharks.



(Bottom image) These 3D objects are said to move interactively with the FS adventure.



Pilot's

Stefan Schaefer unveiled FS Global Upgrade. The new package which is due out in Fall is a replacement for the Microsoft default scenery. By doing this, you'll find that your scenery includes cities, detailed coastlines, highways, roads, rivers and even pipelines. These geographical features and very complete nav aids database were derived from actual aeronautical charts. FS Global Update makes VFR flying especially possible by following the landmarks. It also provides for seasonal changes and have completely new ground, water and terrain textures.



Virtual Skunks

TekMate's Virtual Skunks presented the "next generation" aircraft. Craig and Steve Mosher who are part of the team showed several excellent aircraft models. Their planes have excellent flight models and features not found in others such as retractable landing gear, illuminated landing lights, movable flaps. They are also visually stunning with rounded corners, transparent windows and quality paint schemes.

The Flight Crew

Mungo Amyatt-Leir talked about the European add-on market. He discussed the cultural and marketing factors that makes publishing for the various European countries different than the United States. The Flight Crew is based in London, England and publishes software for the European flight simmers.



Training Associates

Bill Stack talked about using MS Flight Simulator as a training tools. He made a case for flying Flight Simulator "by the book"

rather than just hopping into the plane and going. He's the author of a series of guides for using MS Flight Simulator for training.

Dan Maas Simulations

Dan Maas is a 17 year old sophomore at Cornell University specializing in 3D graphics. He explained some of the newer graphic techniques that will be finding their way to flight simulators over the next few months. You'll see some of Dan's work in an upcoming ABC special "Netforce" by Tom Clancy.



This image is completely computer generated by Dan Maas Simulations

Exhibits

Attendees could spend as much time as they cared roaming through the exhibit hall. Inside they were able to get "hands-on" testing of many of the software and hardware products that the exhibitors were showing. Here's a look at some of them:

AETI

Marty Arant of AETI and author Robert Mackay demonstrated the air traffic control features of the company's new ProFlight 98 add-on for MS Flight Simulator. The package lets you easily lay out a flight plan complete with high quality ATC voice accompaniment. The voices are customizable – you can add your own if you'd like.

Aviation Weekly

This is an Internet-based radio program dealing with all things aviation. The reporters at Aviation Weekly covered the MicroWings Conference. You'll find some of the proceedings of the conference at <http://aviationweekly.com>

Desk Top Wings

Long time flight sim writer and computer columnist Alfred Poor was busy showing his company's publications. Desk Top Wings publishes two popular sets of charts: one for ILS and one for VFR. In addition Desk Top Wings has other flight sim books.

Dynamix/Sierra

A contingent from the Dynamix Division of Sierra flew in from Eugene, Oregon to demonstrate two new products: Red Baron 3D and Pro Pilot 99. As the same suggests, the Red Baron 3D upgrade is enhanced for 3D video card effects. In addition, they've added new aircraft to the package.

Associate Product Manager Phil Cowles said current Red Baron II users can download the upgrade from Sierra's website at <http://www.redbaron3d.com/downloads.html>. The upgrade is available now and the complete package will ship in October.

Dynamix/Sierra

The Dynamix group from Eugene, Oregon also provided hands-on flying of their upcoming Pro Pilot 99 – the new version of their general aviation simulator. Designer Mark Pechnick told us PP-99 features vastly



The MicroWings Conference

enhanced aircraft – 6 of them in all. The flight models are new and so is a completely new 3D graphics engine. The new instrument panels are very clean and easy to read. Brian Gallardo showed us PP-99's high performance 3D mip mapping and cloud rendering. Sierra is planning to release Pro Pilot 99 in October.

Flight Sim Central

Aaron Anderson has one of the more popular web-based and mail order companies that specializes in flight simulation software. His booth was busy tending to the buying habits of the many attendees who were looking for the latest packages and "bargains".

Jeppesen

Jeppesen is the first name in professional aeronautical charts and navigation publications. Microsoft recently completed a five year agreement to license Jeppesen's navigation data for use in any of the Microsoft flight simulation products. This means that Microsoft's simulators can now use real world data making their products closer to the real thing.

Laminar Research

Austin Meyer showed off the latest release of X-Plane simulator. New features use 3D graphics to display the scenery and textures. This unique simulator has a plane maker, parts designer and simulator built into a single product. X-Plane is currently at Version 4+, but Austin updates the package about once a month to add features that users have asked for.

Looking Glass Studios

Tom Sperry gave everyone a preview of the next version of his company's general aviation sim – Flights Unlimited III. In addition to San Francisco, FU-III will also



Pro Pilot 99's 3D graphics are a sight for sore eyes.

include the Seattle area. FU-III adds new planes, improved air traffic control and higher resolution 3D display. Other new features also include interactive flight instruction, dynamic weather and expanded adventures. Tom told us that they expect the new version to be ready in Spring 99 with distribution to be handled by Electronic Arts.

Microsoft

This was Microsoft's "coming out party" for Combat Flight Simulator.



An X-15 made with X-Plane

Jose Pinero, Bruce Williams, Steve Wilson, Phil Saitta and Tim Gregson were on hand to answer questions in the exhibit hall. Although CFS isn't scheduled to ship until November, Microsoft had several PCs running so that users could get a hands-on look (feel) of the new package. Particularly impressive were the 3D graphics effects, the quality of the aircraft and the sound. Aircraft made to the Flight Shop specifications can be easily converted to run under CFS. Additionally, Flight Simulator scenery is compatible with CFS.

Nomissoft

Simon Hradecky demonstrated the upcoming Airline Simulator Pro which is due out in October. Nomissoft has concentrated on making the flight models of the included MD83, MD88 and B-747 as accurate as possible.

SimCom Training Centers

SimCom is a provider of professional pilot training for the airline industry. They're located in Orlando and use high end simulators in their programs. You can contact SimCom at <http://www.simcom.com>.

Summary

The MicroWings Conference was not only a chance to see new simulation products up close; it was an opportunity for users from all over the world to meet and chat in an informal setting – although a hot one – to view the state of the art and what's coming. My only regret is that it wasn't long enough for me to fit all of the meetings, presentations and other activities that I wanted to complete.

Thanks to Robert Mackay and his staff at MicroWings for a successful conference. For more information contact <http://www.microwings.com>.



Pro Flight 98

Custom Adventure and Flight Management Utility for FS 98 from AETI

Reviewed By Tim Dickens

I've been an avid fan of Microsoft Flight Simulator for almost 15 years, but I have always missed one aspect of realism: Air Traffic Control (ATC). In the real world, flying is not a private experience, in which you simply jump into your plane (presumably already fueled and

waiting for you at the end of the runway) and take off in any direction you like, oblivious of the world around you.

This issue was first addressed by Flight Shop for FS 5.1, which brought the concept of *adventures* to the simulator. This gave the flight simmer rudimentary ATC messages, which at least gave an impression of what

real-world flying is all about. Unfortunately, the adventures themselves were very limited in the kind of ATC messages and chatter you received, with a limited number of canned messages in the form of .WAV sound files.

What Flight Shop *did* do is provide an open architecture for users to program their own, more complex adventures and ATC interaction (with emphasis on the word *program*). Creating a realistic adventure required programming skills and a lot of time to interpret the complex coding, along with the laborious task of creating custom .WAV files in several different voices. Typically, the voices from even the most earnest adventure programmer sounded more like those pre-formatted automated telephone messages we have all come to loath.

So, I have been on a personal quest to find an easy-to-use program with a friendly Graphic User Interface (GUI) that will generate realistic ATC adventures using a wide variety of realistic .WAV files. I want something that makes me believe someone on the radio is talking, with chatter that *really* sounds like aircraft and ATC talking back and forth.

Finally, at long last, I have found all of this in **ProFlight 98** from AETI.

Overview of ProFlight 98

ProFlight 98 is an advanced navigation/planning utility for creating realistic flight plans and adventures for MS FS 98. It will generate VFR (Visual Flight Rules) and IFR

... I have been on a personal quest to find an easy-to-use program with a friendly Graphic User Interface (GUI) that will generate realistic ATC adventures using a wide variety of realistic .WAV files. Finally, at long last, I have found all of this in ProFlight 98 from AETI.

Full Throttle Feature Review

Feature Review: Pro Flight 98

(Instrument Flight Rules) flight plans, just as a real-world pilot would be required to do. The flight planner will also generate flight plans using the SID (Standard Instrument Departure) and STAR (Standard Terminal Arrival Route) airways, if you so choose. ProFlight 98 will then take that flight plan, with the departure airport, waypoints and arrival airport information, allow you to add

custom weather to the flight path, and then generate an ATC adventure. It does all this within just a few minutes, less time than it takes for a real-world pilot to generate and file a flight plan!

In addition, ProFlight 98 includes:

- ✈ A Flight Management Computer (FMC), which operates very much like the computer used in commercial and advanced business jet aircraft.

- ✈ An Aircraft Personalization Wizard that allows you to customize the Cessna, Learjet and Boeing 737 with different combinations of trim, liveries and panels.

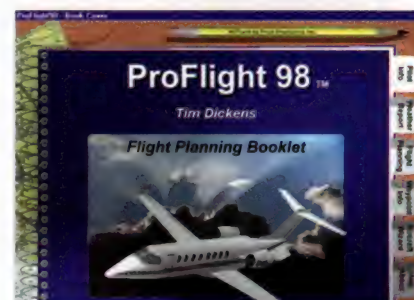
- ✈ A Boeing 777-300 airliner with excellent visual and flight models, equipped with a fully functional FMC.

- ✈ A very nice owners manual with very complete instructions, in a three-ring binder to hold your flight plans, charts, etc.

The Flight Planner/ Adventure Builder

The GUI for ProFlight 98 is one of the easiest and most straightforward I have seen among flight simulator add-on utilities. It goes step by step and makes it very difficult to get lost. As you follow the steps, an aircraft is selected, your own custom callsign is specified, a flight plan with waypoints is created, weather is specified and an adventure is compiled and placed into your FS 98 adventure directory. You are ready to fly in a very short time. A quick reference is included in the manual, which will take you through the steps without making you scratch your head and ask "huh?"

When you execute the program, you find a flight planning book cover, with self-explanatory tabs that reflect the different aspects of the program. Just follow the tabs, 1-2-3, and you are done.

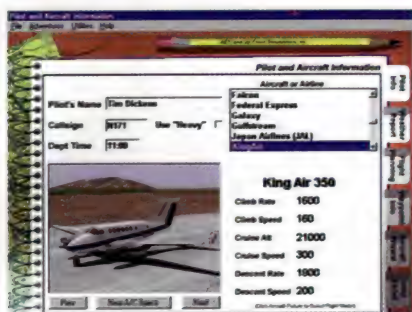


The first tab is the pilot information page. Here you select your callsign and aircraft specifications. The flight plan and adventure are created with your aircraft's performance specifications in mind. A very wide selection of possible callsigns and aircraft are included. But one of the very attractive features of ProFlight 98 is its flexibility. It includes utilities that will allow you to add your own favorite aircraft specifications and create your own callsign.

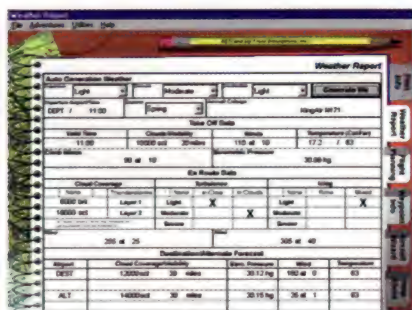
Installation

Installation from the CD-ROM was simple, quick and uneventful. All files are placed where they belong, and you are quickly ready to get started (after re-booting your computer so that Windows can allocate the necessary files).



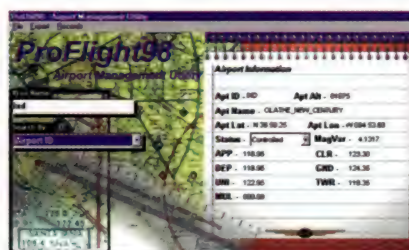
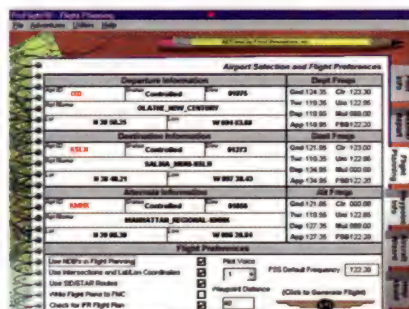


The second tab allows you to create weather for the departure, en-route and arrival aspects of the flight. As is the case with adventures in general, more complex cloud/wind layers can be created than you can do within the advanced weather dialog menu in FS 98. You can select a variety of weather combinations by cycling through the *Generate Wx* tab, but you can not select individual aspects of each category of clouds and wind. Hopefully, this can be improved in future versions.



The third tab sets up the departure, destination and alternate (always required in a real-world flight plan) airports. You also select what kind of flight it will be, i.e., VFR or IFR, and specify if you want to use the SIDs/STARs/Intersections airways. You also choose what kind of nav aids (VOR, NDB) will be used as waypoints. ProFlight 98 utilizes a large database that incorporates all of these parameters in flight plan creation. This is where I was pleasantly surprised. My previous experience with flight planning and GPS utilities that utilize their own database for this information has not been good. Typically, they will include some or (if you are lucky) all of the default FS 98 airports, but if you want to fly through some of the more detailed add-on scenery, forget it. You would have to spend a day (or two) adding data to use the program. This is what I expected when I got to this point in my first flight plan. *Man, was I surprised!*

I made my first test flights within my own Kansas scenery, which I created for FS 98 and has over 110 airports. Only 15 of those were already within the FS 98 default scenery. I fully expected to spend an eternity entering airport and runway data for the other 100 or so. I was flabbergasted to find *every single airport* within the ProFlight 98 database. Even the little puddle-jumper airports that nobody but the local farmers have heard of! The publisher informs me that they acquired (at high cost) the database from NOAA, and it is extremely accurate. It is no idle boast—I confirmed the accuracy by checking several of the Kansas airports. But again, flexibility is incorporated; a database management utility allows you to add and customize the data. This comes in very handy if you want your adventures to start at a particular location on the apron of your favorite airport.



The next step is to simply go to the menu bar and select **Adventures | Generate Flight Plan**. ProFlight 98 will calculate the flight path and waypoints according to the parameters you have specified and generate a list of waypoints for your review. Select **File | Print Flight Plan** for a written plan to follow during your flight. Now just select **Adventures | Save adv. as** and give your adventure a name. ProFlight 98 compiles the adventure and tells you (in ATC voice) what frequency to tune in to begin the adventure. That's it—you are ready to fly!

Flying the Adventure

This is where ProFlight 98 really shines. The adventures generated by ProFlight 98 make use of a very extensive array of original .WAV files. The adventures are coded to present the .WAV files in a fluid and consistent manner, without breaking up individual ATC communications with different voices, at a very broken cadence. Even though the individual phrases, for the most part, are recorded in short sequence .WAV files, the message comes through as one consistent voice, like "Taxi to runway thirty-five and hold short," instead of "Taxi...TO RUNWAY thirty ... FIVE ... and...HOLD short," with two or three different voices within the same message. Six separate ATC voices are used in ProFlight 98. There are numerous selections that you can use as your own voice, to make requests, reports, etc. You can even record your own voice according to a script provided for those outgoing messages. Of course, all of these .WAV files will take up space on your hard drive. The whole program occupies about 80 MB for if you choose the full install. So, if you are short on storage space, you may consider this a drawback. But if you want your COM radio to give realistic ATC, there is really no other way to do it. In my opinion, it is well worth clearing some dead weight off the hard drive to make the necessary room.

Compared to other adventures I have flown, I find the commands from ATC, and their sequence, much more realistic. I made and flew ten flight plans/adventures for flights between 100 and 600 miles. I never received conflicting commands, like being told to turn to heading 90 and then immediately told to turn to heading 260, etc., as if the guy in the tower was slightly inebriated. The descent commands and vectors to the runway for ILS approaches were also logical and consistent. Like all adventures I have flown in the past, you need to get your aircraft in the position and altitude you are supposed to be at in order for the sequence of ATC commands to get you to the runway. Otherwise the command sequence is broken and you end up flying to parts unknown. But I found that normal flying skills should suffice here, where some adventures I have experienced are downright anal retentive about hitting those vectors.

The chatter is also very realistic. You'll hear one smooth message (in one voice) from ATC and a matching response from the other aircraft. The frequency of the chatter is very natural at the default settings and can be decreased when flying in less populated areas. Additionally, .WAV files for all of the major air traffic centers in the US (presently) are provided. The adventure builder keeps track of where you are flying when coding the adventure, so when you are flying through Kansas and Missouri, you send/receive messages and hear chatter from Kansas City Center. Once you fly some distance into Illinois, for example, you are told to contact Chicago Center. It's very realistic. Uncontrolled airports with UNICOM only have similar interactive commands/messages on those frequencies as well, along with the corresponding chatter.

A wide variety of keystroke commands for outgoing messages/requests you can make to ATC are printed on a convenient reference chart for use during your flight. In a short time, you get the hang of the message format and find you hardly need to reference

the chart. I guarantee you have not experienced MSFS ATC adventures with this much realism before.

Flight Management Computer (FMC)

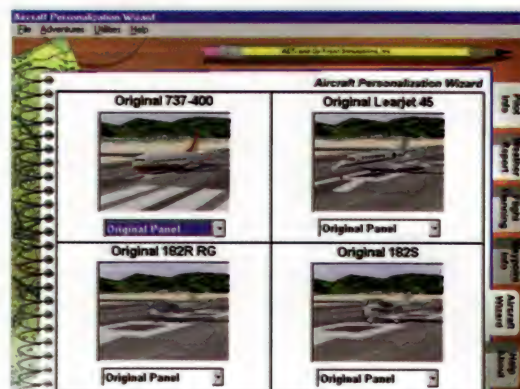
The flight planner/adventure aspect of ProFlight 98 is the meat and potatoes of the program. The FMC is definitely the gravy. This is a fully functional FS 98 gauge interface to the flight plan generated by ProFlight 98, including all of the options of any GPS gauge you may have used already, with the addition of an information center very similar to that found on modern jetliners and business jets.

Since it is a gauge, and not a separate Windows 95/98 program window, it is accessible to full-screen 3-D hardware users. One of its unique features is that in normal flight operation, the FMC is displayed on the panel in a minimized size, so that its large display area does not obstruct the main panel. When you need to access all of the information/features of the FMC during flight, a single left-click on the minimized gauge brings up a large, full-size display.

When generating a flight plan in ProFlight 98, you simply select the option Write Flight Plan to FMC and the data will be stored in a separate directory within the FS 98/ProFlight 98 folder. The stored flight plans may then be accessed by the FMC in flight for use.

Data on your current position, which leg of the flight plan you are on, distance to next waypoint and airport/runway data may be accessed from the main FMC display. The FMC will send the instructions to fly to the next waypoint to the autopilot, including the proper altitude for that waypoint. This makes the FMC a fully functional GPS/information center.

Panels for the Boeing 737, Learjet and the Boeing 777-300 bonus aircraft that comes with ProFlight 98 have the FMC already built in.



Since the FMC is an FS 98 gauge .DLL, it can also be added to any aircraft you wish by editing the respective panel.

The addition of the FMC to ProFlight 98 makes it a fully functional navigation program, as well as a flight plan/adventure generator.

Aircraft Personalization Wizard

Since we have already tasted the main course (flight planner/adventures) and the gravy (FMC), let's talk a little bit about the desert: the Aircraft Personalization Wizard. This is a very slick little utility that offers you different paint and panel schemes for the default FS 98 aircraft by simply clicking on the GUI viewer.

I have always been unhappy with the paint scheme of the default Learjet 45. But even though I have repainted many aircraft using PaintShop Pro 5, I never got around to doing the Learjet. When I browsed through the Aircraft Personalization Wizard, I saw a blue pinstripe paint scheme, which was basically what I had in mind. So, I selected this paint scheme and ran the wizard. Voila! The aircraft was repainted!

Do take notice of the warning in the instructions to backup your original textures and panel. I made the mistake of not running the backup feature of the wizard first, thinking that I was not electing to make any changes to the panel (I thought). It trashed a custom Learjet panel that I had made (fortunately, I *did* have another backup). If you run the wizard backup feature first, you will not have this problem.



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Conclusion

I can not express too much enthusiasm about this excellent new addition to the FS 98 world of add-on software. In fact, from the point of view of an ATC adventure enthusiast, it is the most important and functional addition to FS since Flight Shop, in my humble opinion.

The quality and functionality of the ATC adventures it generates are such an improvement over anything you have run previously, that you simply will not believe the difference. Considering this, plus its other utilities and features, ProFlight 98 is an absolute must for any ATC-oriented FS 98 simmer. Check with your favorite flight simulation retail vendor for price and delivery.

For More Information

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Fax: 714-551-2695
www.simplot.com



Product Reviews

Reviewed In This Issue Are:

Super Flight Planner
HQ Aircraft Collection 98
DC-3
Scenery Vienna
Europe 3 Scenery

Super Flight Planner Flight Plan / Adventure Builder

Review by Tim Dickens

Super Flight Planner (SFP) is the latest freeware contribution from Central Park Informatica, a.k.a. Alessandro Antonini. Alessandro has been a prolific contributor to the FS world for a number of years now, volunteering a wealth of knowledge and very handy utilities. You can visit his Web site (<http://members.tripod.com/~theflyguy>) to get a real appreciation of what he has available for you, including this new addition. Follow the links on his Web site to download Super Flight Planner. It comes with an easy-install setup program.

Additional Programs/ Files Required

- ✈ WinPlanner WAV files, for Adventure voices (about 900 K). You can find this file at <ftp://ftp.flight-sim.iup.edu/flight-sim/uploads/wp31r1.zip>.

- ✈ APLC32 1.23 or higher by Martin Smith, to compile ATC adventures (about 700 K). You can find this program at <ftp://wings.ark.com/wings/fs98/adv/aplc123.zip>.
- ✈ For those who don't have BAO Flight Shop, download AAFWAV.ZIP at <ftp://wings.ark.com/wings/fs5/adv/aafwav.zip>.
- ✈ SCASM 1.7 or higher, for compiling FIX files (85 K). You can get SCASM at <ftp://wings.ark.com/wings/fs5/design/scasm17.zip> if you do not already have it (optional).

The Software at a Glance

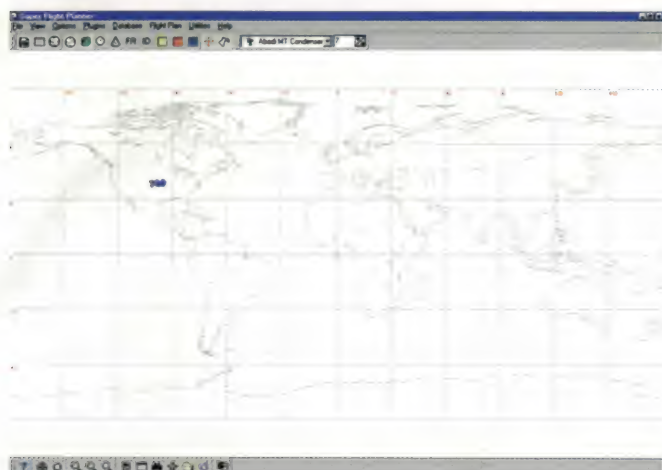
SFP is a very easy-to-use flight planner and ATC adventure generator for Microsoft FS 98 and FS 95. It provides you with a very easy-to-use graphic user interface (GUI) to create a flight plan very quickly. You can then take this flight plan and open another GUI that will create an ATC adventure in standard Flight Shop\WinPlanner format or any other format you wish to add to it. Flight plan waypoints, as well as ATC adventure parameters for takeoff/landing runways, weather generation, ATC frequencies, ATC sound (.WAV) files and departure/approach

criteria are all user selectable. These features, and how the program works, are described in more detail below.

Features of Super Flight Planner

- ✈ SFP reads data directly from the .BGL scenery/navaids files within your Flight Simulator, rather than relying on a preformed database. If the airports and navaids exist within your scenery directory structure, the data can be accessed within SFP.
- ✈ The extremely flexible, open architecture program will allow for additional plug-in modules. Programmers may apply their own preferences and parameters to create a .DLL module, which SFP will accept and incorporate into its ATC adventure, compile routine. A Software Developer's Kit (SDK) is provided to aid programmers. If you are not a programmer, I think you can count on some contributions from the many programmers who share their work on the Internet.



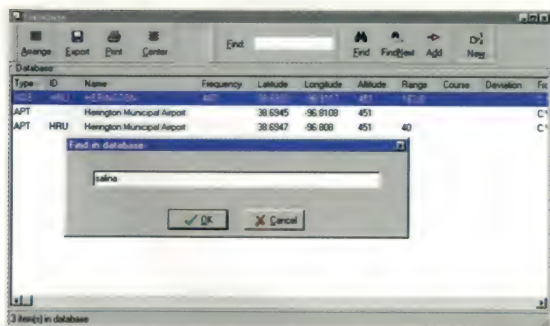


Kansas scenery files displayed on the SFP map

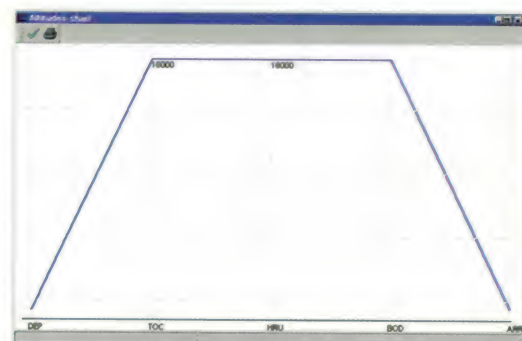
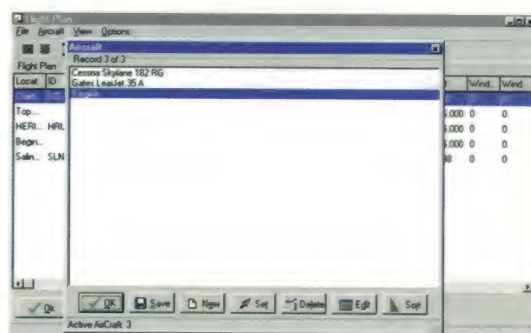
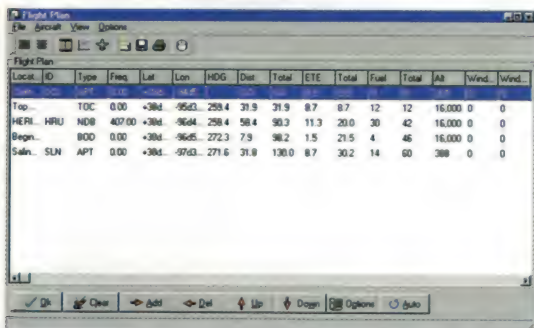
- ✈ SFP can use either the WinPlanner or a proprietary ATC adventure format (a Flight Shop-compatible format is also planned for the future). It has full support for text only, speech only or both text and speech ATC, ATC chatter and radar departures. Each flight can have individual compile parameters.
- ✈ SFP will display and print a flight profile and flight plan for use during your flight. You may print and preview the whole map or just a selected portion of it, with nav aids and a flight plan path. Maps can be exported to .WMF format as well.

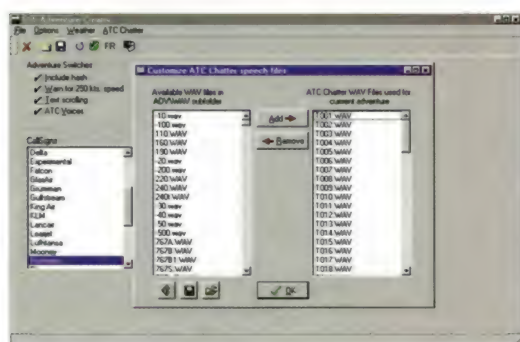
- ✈ The program will automatically calculate top of climb (TOC) and beginning of descent (BOD) points for your ATC adventure. Wind, magnetic variation (Magvar), automatic ETE, Course, Speed, Fuel consumption and Great Circle Distance calculations are made from data read from FS. Either manual or automatic weather generation can be compiled into your adventures. SFP will support three kinds of altitude parameters for your adventures: manual (user specified), automatic (according to flight plan route total distance) or it can be obtained from the aircraft database for the active aircraft.

- ✈ SFP has the ability to export data files for the most popular gauges and add-ons available, such as DPGPS, ACGPS, TAGPS, PRO-Controller and NavDash. Real Weather GPS flight plan export is available as well.
- ✈ SFP features a completely integrated aircraft database. You can specify aircraft parameters for practically all existing aircraft models.
- ✈ Expect full support for intersections wherever NDB or VOR nav aids are missing. Presently, fixes and intersections must be created by inserting NDBs with a zero frequency value into the scenery. SFP also has an FLT2BGL command line utility to automatically convert Math Maessen's FLTPLN 4.0b FIX database to a .BGL scenery file. You can find Matt's program on lup.edu at <ftp://ftp.flight-sim.iup.edu/flight-sim/uploads/flightpln40.zip> or at Flightsim.com at <http://www.flightsim.com> (go to Search File Libraries at look for FLTPLN40.ZIP). Also, a quick insertion utility for fixes, with the ability to save current FIX entries to a .BGL file is included in SFP. Full SID and STAR support is planned in the near future.

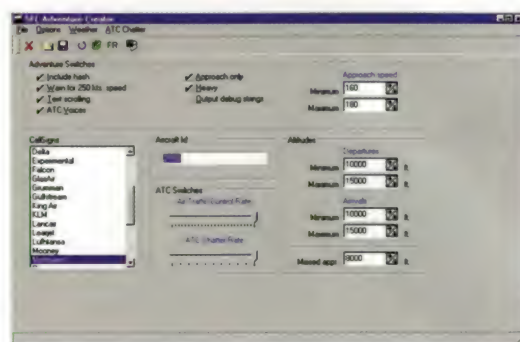


(Top left) Select your departure airport, waypoints and arrival airport from the database. (Bottom left) Your finished flight plan, which you may print for use during your flight. (Top right) The aircraft database. (Bottom right) An altitude graph can also be displayed.

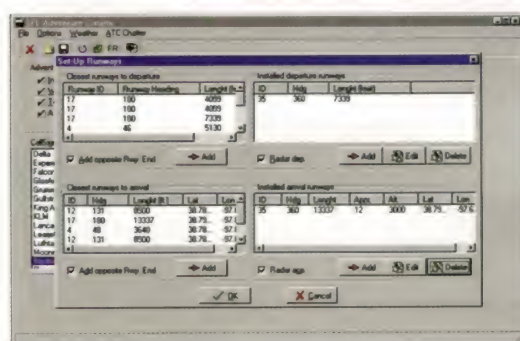
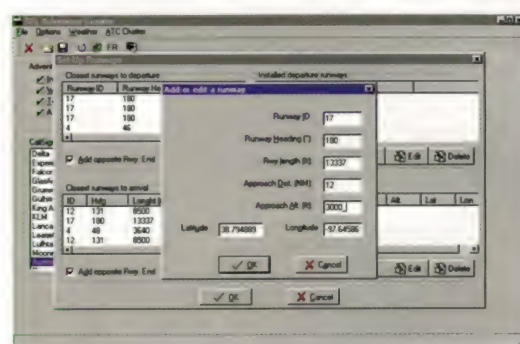




Images on this page starting on the right and moving clockwise (Top right) The main adventure builder menu. (Below right) Specify your arrival and departure runways (read from active database). (Bottom right) Select the approach parameters for your arrival airport. (Bottom left) Special menus for departure, enroute and arrival weather are available.



(Below left) Specify the various COM frequencies for your departure and arrival airports. (Top left) You may also customize the sound files used during your adventure.



The Super Flight Planner Menus

Using SFP is very easy with its GUI. You start out with a map of the world. At this point, you can select all of the files from your current World.vis file (scenery library), or from individual scenery file sets that you can create yourself. Here, I have created one for my own Kansas scenery, which is projected on the map.

Your departure airport, waypoints and arrival airport are selected from the database search engine, which contains all of the data you have opened on the map above. Once all of the airports and waypoints have been entered, you open the flight plan from the menu and a list is presented, including your

top of climb and beginning of descent waypoints. Select the aircraft you wish to fly. You can add data for any aircraft to the SFP Aircraft Database. The performance characteristics of the aircraft are calculated into the flight plan for TOC and BOD. An altitude graph can also be displayed.

If you want to create an ATC adventure based on your flight plan, open the Adventure Builder. The main menu will allow you to select a callsign, as well as most of the advanced features of the adventure format you wish to fly. Also, separate menus to specify departure and arrival runways, airport frequencies, weather generation and ATC sound (.WAV) files can be used to further customize your adventure.

After you have selected all of the parameters you want, simply select "Save" and the adventure is automatically generated and placed into your FS 98\Adv directory. That's it! You are ready to fly!

Flying the adventure

Just go to the **Flights | Adventures** menu in FS 98 and select your adventure. The adventure will load and you will be placed at the starting point at your departure airport, which, unfortunately, will be the arbitrary coordinates of the airport (usually around the center). This is typical of FS adventures and is rather inconvenient—and sometimes quite hazardous! In one case, those airport coordinates turned out to be the center of a



tree, which I had crash coded. BOOM! In another case I was placed in the middle of a pond (which I had splash coded). PA-LOONCH!

Alas, there is a remedy for this! If you compile your adventure in the WinPlanner format, you can use a little-known work around. You can code the adventure to load a flight (situation) of your choice when the adventure loads. It only requires simple text editing and a manual re-compile. Here is what you do. In this example, we assume you have saved your flight plan as "Mystn."

1. Before you load the adventure, create a flight with your aircraft/location preferences. Save it. In this example we will call it "MYSTN."
2. Locate the source file created by SFP. It can be found in the Plans subdirectory under Super Flight Planner (unless you are one of those people that like to change the defaults around). The source file you want will have the name of the flight plan you saved, with an ".APL" extension. This is in fact a plain text file. In this case, it is called MYSTN.APL.
3. Use a text file program, such as Notepad, to open this file.
4. Search for and find the label "InitVars:." Immediately below the words NORTH_LATITUDE and EAST_LONGITUDE, add a line that says: LOAD_SITUATION "MYSTN" (note: don't include the .STN extension).
5. Now look for the line that says: PosistionAircraft = 1. Change it to PosistionAircraft = 0.
6. Save the .APL file and close it. Now find the directory where the actual adventure compiler, APLC32, is located. To make things simple, just move the file MYSTN.APL over to that directory. Recompile by selecting **Start | Run** and typing "aplc32 Mystn.apl Mystn.adv." The adventure will be recompiled and replaced in your FS adventure directory.

Now when you load the adventure, the flight you have saved will automatically be loaded with the aircraft, settings and coordinates you specified.

The ATC Adventure

The end result is that you will have an adventure of the same quality of the Flight Shop or WinPlanner adventures, but with the ease of use provided by the GUI. The adventure compiled by SFP will provide you with departure vectors, notification when you pass each waypoint, some in-flight chatter and arrival vectors.

Although you are limited (as the program comes stock) in the .WAV files and adventure format provided from WinPlanner and Flight Shop (AAFVAV .WAV sound files), SFP does have room for future expansion and programmability with its plug-in module capability. The Flight Shop/WinPlanner sounds and format are not the best ATC available, to be sure. You may hear stuttering types of messages and several different voices within the same message. And the interactive ability of the adventures is limited. But with the pool of talent available through the Internet, who knows how sophisticated these adventures can become? This could grow into a program that produces very intricate interactive adventures.

Conclusion

If you are looking for an easy, freeware GUI interface to produce Flight Shop/WinPlanner adventures or if you have some programming abilities and would like something to build on, this program is for you. The adventures created by SFP are a tremendous improvement over the dry, isolated environment of flying FS without any ATC enhancement at all. After you start flying routinely with these easy-to-produce, custom adventures, you will have no more interest in the archaic, scrolling messages from the standard FS ATIS messages. Super Flight Planner is another winner in a long line of very useful and unique add-on utilities from Alessandro Antonini. We should all be very thankful that such people are contributing their time and talent to make this hobby more enjoyable for everyone.

For More Information

Alessandro Antonini
<http://members.tripod.com/~theflyguy>

Super Flight Planner is
FREEWARE

HQ Aircraft 98 Collection

Review by Brian Howard

How many times have you climbed into the cockpit of Flight Simulator's default Cessna? I've done it more times than I could possibly count, and frankly, it gets a little boring. The high-performance Extra 300 and the antique Sopwith offer some single-engine variety, but you're not likely to find either at your local field. If you prefer the heavy iron (big jets), you're limited to Boeing's 737 (not that there's anything wrong with the 737—but it's a paltry offering considering that big jets rank



	Aircraft	Models Included	Length (meters)	Wingspan (meters)	Engine	Passengers	
	C185 Skywagon	3	7.81	10.92	1 x Continental 10-520	6	
	Commander 114B	2	7.75	9.98	1 x Lycoming IO-540-T4B	4	
	PA32 Saratoga	4	8.5	11	1 x Lycoming 300 PS	6	
	PZLM20 Mewa	4	8.72	11.86	2 x Teledyne Continenta	6	
	560 Citation V	2	14.9	15.9	2 x Pratt & Whitney 2900 lbs	8	
	Fairchild Dornier 328Jet	2	21.28	20.97	2 x Pratt & Whitney PW306B	32 (34 in Europe)	
	C160	4	32.05	40	2 x Rolls Royce TYNE MK22 turboprops	93	
	MD82	4	45.06	32.87	2 x Pratt & Whitney 9072 kp	172	
	Storch Fi 156	4	9.9	14.25	1 x Argus As10C-3243P	2	
	Widgeon	3	9.47	12.19	2 x Lycoming GO-480 270 P	5	
	Ju 52/3m	3	18.9	29.25	3 x Pratt & Whitney Hornet	14	
	Comet	4	35.97	32.87	4 x Rolls Royce Avo	100	

among the most popular simulator planes). A larger selection of aircraft greatly improves your choices and even the realism.

But if you want to do things properly, it's difficult to find quality, additional FS aircraft. Many airplanes are available for downloading from the Internet, but that can take much time (and money, depending on how you access the Internet). Even more of a concern, you have no way of knowing if the airplane you download will fly like an

airplane (or more like a refrigerator) until after you have installed it. And then you get the fun of mucking around with panel configuration files.

Another alternative is to buy a box of aircraft from a retail or catalogue store. But again, you can't be sure of the quality until after you've spent your money. And that's why I'm here. I have recently been flying the aircraft from Technic Direct's **HQ Aircraft Collection 98**. This box contains 39 aircraft,

20 cockpits and almost 200 (199, to be exact) .GAU files, which become gauges, switches, radios and warning lamps in FS. It includes a full HTML manual, customizable installation routines and detailed descriptions and facts about each plane. And by the way, the panels support force feedback.

The HQ Aircraft Collection 98 contains 12 primary planes: Cessna C185, Rockwell Commander 114B, Piper PA32 Saratoga, Mielec PZLM20 "Mewa," Cessna 560 Citation V, Fairchild Dornier 328 Jet, Transall

Comments	
	The high load capacity makes the C185 ideal for bush flying, firewatching and sport.
	Retractable gear, leather seats & soundproofing are standard.
	This business plane features a pressurized cabin, a/c and one seat may be replaced with a kitchen/bar.
	Originally licensed as a Polish Piper Seneca II, the "seagull" is used for business, freight and as an air ambulance.
	This popular twin-engine business jet is particularly suited for operation by one pilot and it can use short runways (it only requires 800 m).
	One of the most modern and quiet commuters, only four prototypes were flying as of spring 1998.
	This multipurpose transport has a load capacity of 16 tons, making it very versatile for moving people and equipment.
	Alongside Boeing's 737, MD80s are the most widely used short- and middle-range passenger aircraft.
	The Storch first flew in 1936, and almost 3,000 were built.
	The amphibious Widgeon is popular with the Air Force, Coast Guard and Navy as a light transport and coastal patrol.
	More than 5,000 were built since 1932, though few survived WWII; only 6 are flying today.
	The Comet series began in 1944, when the passenger jet was a new idea and most airlines were using converted bombers.



(Left) The C160 definitely towers over a Cessna. (Right) The C160 panel, showing the fuel management panel in the lower right.



C160, McDonnell Douglas MD82, Fieseler Storch Fi156, Grumman (Super) Widgeon, Junkers Ju52/3m and de Havilland Comet. Each of these has at least two (most have four) varieties. Original panels accompany the planes, which are gorgeous inside and out.

The Setup program runs through your Web browser, instead of an InstallShield-style routine. As a consequence, you must have a Web browser installed (Internet Explorer 4.0 is conveniently provided on the CD). When starting the install, your computer may think you're downloading, though there is no need to copy the install program to your hard drive; just run it from the CD. You may install any of the planes individually or install them all together (for which you'll need about 800 MB of free space on your hard drive). A truly international package, HQ AC98 offers English, French and German text.

Although the printed documentation is sparse, the HTML manual fully explains your installation options, as well as the details of each aircraft. This works well, because you can see the plane and each of its varieties. Just click on one of these for specific details. Another click lets you see that plane's instrument panel. And if you have a question about any of the gauges you see, just click on the instrument panel image to go to another page that has a close up of the gauge and a full explanation.

I don't have the space to tell you about each of the planes in detail. The convenient chart shows you a little about each plane, and I've picked a few favorites to more fully explain.

Of course, I had to take the C160 multipurpose transport out for a spin. The standard version, powered by two big Rolls

(Right) The Cessna Citation V business jet is a popular twin-engine business jet. The engine instruments (to the right of the panel) are identical to those on the real thing.

(Bottom of page) The Ju 52/3m is an all-metal, single-wing, 14-seat transport powered by three 660hp engines spinning two-blade props. The panel features a modern Collins radio but everything else is original gear.

Royce engines, can carry 93 troops. The medical version carries 62 stretchers plus attendants, as well as some vehicles and palettes. Its large wings and tailgate allow supplies to be dropped from low altitudes without parachutes when necessary. Many humanitarian groups fly C160s, as the Red Cross did during the Bosnian airlift.

The C160 panel is laid out a little differently than most panels. The altimeter is beneath the airspeed indicator toward the left, and the vertical speed indicator is where the altimeter usually is. The angle of attack indicator and radar altimeter are handy for drop operations. The fuel management gauges and switches are very useful for long trips. Fuel can be pumped to or from the right and left tanks to balance your load, and fuel may be drawn from either or both tanks. Use FS's **View | Instrument panel** menu to toggle the fuel management panel, throttle/flap/brake panel and radios.

The C160 is a big, heavy aircraft, so be prepared to fly it as one. Anticipate your maneuvers, and be careful not to over correct. Keeping these simple points in mind, flying the C160 is a blast.



I also want to mention the Cessna Citation V business jet and the Junkers Ju 52/3m. The Citation is a twin-engine business jet. It is popular because it is easy for a single pilot to operate and it can land anywhere a prop twin may—it only needs 800 m of runway (the reverse thrusters aid in this). The engine instruments (seen on the right of the panel) are identical to those on the real thing. The avionics are by Honeywell and Collins. The Citation was one of the first business jets to have Electronic Flight Information System (EFIS). The plane itself flies very smoothly, and is the ideal commuter in my mind.

The Ju 52/3m, a.k.a. Tante Ju, is an all-metal, single-wing, 14-seat transport powered by three 660hp engines spinning two-blade props. More than 5,000 were built since 1932, though few survived World War II. Only six are known to be flying today. Its versatility is largely responsible for its popularity. It can be fitted with floats, a large freight door and a toilet/kitchen set. The plane pictured here was built under license in Spain and recently



restored by South African Airways. The panel features a modern Collins radio, but everything else is original gear.

That means the ADF and your compass are the only nav aids available. As expected, the controls of this older plane are more temperamental than the others I've mentioned here, but I credit that to realism rather than a deficient flight model.

Even though (or maybe because) it took more effort than some of the other aircraft in the HQ Aircraft Collection 98, this was my favorite of the lot. Loading the Tante Ju allows me to use FS as not only a flight simulator, but also a time machine. I can go back to when the skies were much less crowded, and imagine Amelia Earhart or Indiana Jones perusing their notes in the seats behind me.

If you want to add to the planes available in FS98, few packages rival HQ Aircraft Collection 98 in the number and quality of FS aircraft. I enjoyed flying all the planes, and a lot of work obviously went into creating the panels. The aircraft look great inside and out. I appreciate the research that went into each of the specific models of planes as well. Beyond the simple specifications I've included in the chart, the history and application of many of the planes are fully explained in the HTML manual.

If you want a large selection of nice planes that install easily, then you need to consider HQ Aircraft Collection 98.

For More Information

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DC-3

Review by Scott M. Slaughter

No one can argue that the DC-3 isn't a legendary aircraft. The historic "Gooney Bird" has been in service since 1936 and is one of the most popular commercial aircraft ever designed, built and flown. Over 10,000 DC-3s were in service from 1935 to 1947, serving several roles in military and civilian service. For example, its military service extended from a W.W.II army transport to a Vietnam gunship. It has also been a successful airliner for many airlines around the world. The first commercial flight for profit occurred on June 25, 1936: an American Airlines DC-3 flew from New York to Chicago.

Even today, more than 1,000 Douglas DC-3 aircraft are in use. Most are used by third-world militaries to transport cargo, but some commercial companies in the U.S. still fly DC-3s. You might get lucky and see an operational aircraft at one of the nation's larger airports. However, your best shot at seeing one flying is to visit an air show. You might also find a DC-3 at aircraft museums.

If you're not lucky enough to see a real DC-3, Alpha Software has another alternative for you. They've recently released three add-ons for Microsoft FS98, and one is **DC-3**. There's no mistaking what the **DC-3** package contains. You won't get several models ranging from a Cessna to a 747 in one package. Instead, you'll fly only one aircraft: the legendary DC-3. Although the package contains just one aircraft, it's designed by a leading expert and based on experiences of real-life DC-3 pilots.

Although the **DC-3** package provides only one aircraft, ten versions of the DC-3 are represented. Unfortunately, these versions are basically the same plane with different paint jobs. Some versions portray specific airlines that are probably unfamiliar to you (such as



Mohawk, Ozark and DanAir) and others are more recognizable, such as Air France. However, it also includes a rare C-47 ski variant, complete with South Pole scenery



and sound effects. This aircraft is a Douglas R4D-5 (C-47H) Ski version of U.S. Navy Air Development Squadron Six (VX-6). It made history on October 31, 1956, when it became the first aircraft to land on the South Pole.

The Antarctic Airfields scenery package is included with the program. Despite being scenery for the South Pole area, don't expect to do a lot of sightseeing. You can take off and land at only three airfields (Kilo Mike, Tango Mike and South Pole Station). Don't worry, you won't have to set the default Meigs Field to winter and fly from Chicago to the South Pole. The manual tells you how to use the South Pole scenery. The manual also explains that you cannot fly to the South Pole itself in FS98.

The different versions of the DC-3 included with the **DC-3** package are complete with landing lights, working cowl flaps, excellent sound and realistic handling capabilities. (Cowl flaps are the removable front covers of an aircraft, forward of the doors, that are attached to the windshield and instrument board. They help control engine temperature.) **DC-3** includes four cockpit panels, with 40 functional gauges. A virtual cockpit is also included. The manual also explains how and why the "throttle quadrant" is important when flying the DC-3.

DC-3's best features are its ten adventures, designed by leading aircraft designer Barry Blaisdell. They'll definitely test your flying abilities. The adventures all include real air traffic control. These adventures are quite diverse and take place all over the world. I especially enjoyed the adventures through Rome, London and Aruba. The other adventures, including Japan, the Caribbean, Miami and others, were also enjoyable.

You may find flying the DC-3—especially maneuvering around mountains—to be especially difficult. This is not the program's fault, but a reality of the DC-3. Its two propeller-driven engines can only produce enough horse power to achieve a climb rate of 1,100 feet per minute. Even such basic tasks as taxiing down the runway require skills that must



be learned. Fortunately, the manual includes several pages of DC-3 flying tips—including taxiing, taking off, climbing, turning and much more.

If you're not familiar with the history of the DC-3 or why this aircraft is considered a legend, the **DC-3** package includes a 20-minute documentary featuring vintage footage, historical photographs and classic flying stories. You can even create a Windows 95 DC-3 theme desktop. Unfortunately, no mention of how to run the video or how to create the DC-3 desktop is mentioned in the manual, so you're on your own for that.

This package is probably not for beginning simmers. But, if you're ready for an older aircraft or one that isn't as easy to fly as a jet or a single-engine prop, consider the **DC-3**. Installation was quite simple. Just insert the CD-ROM, follow the on-screen prompts and **DC-3** will do the rest. I enjoyed flying all the planes and adventures. The appearance of the aircraft is overall pretty good. The package does a good job of presenting the "Gooney Bird"—both real and in Flight Simulator.

For More Information

Alpha Software
168 Middlesex Turnpike
Burlington, MA 01803
(781) 229-2924
(781) 272-4876
www.alphasoftware.com



Scenery Vienna

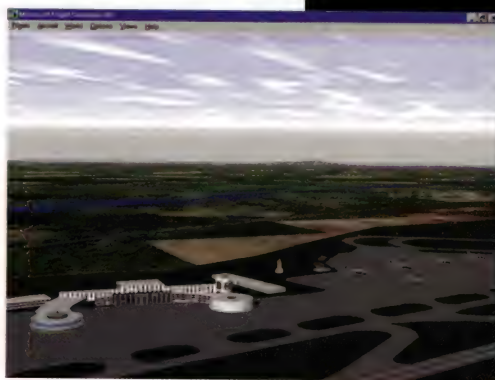
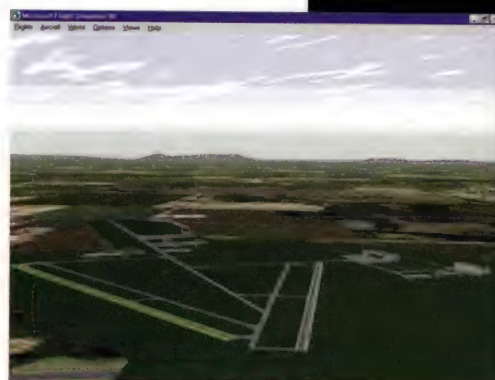
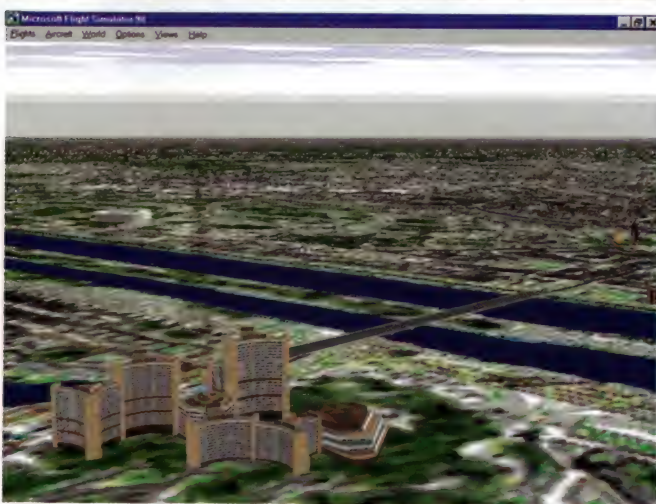
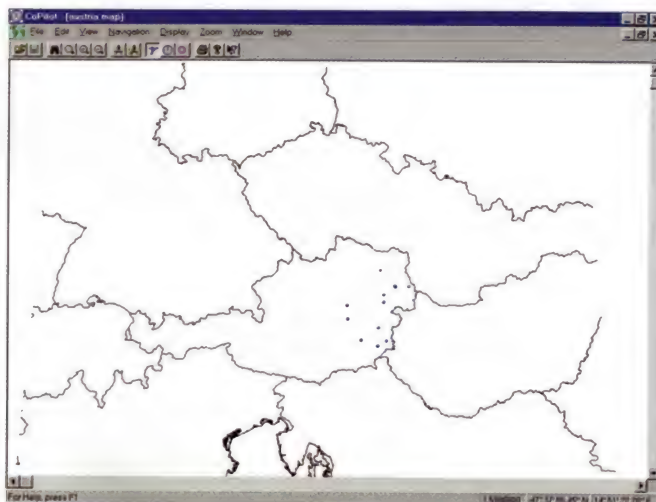
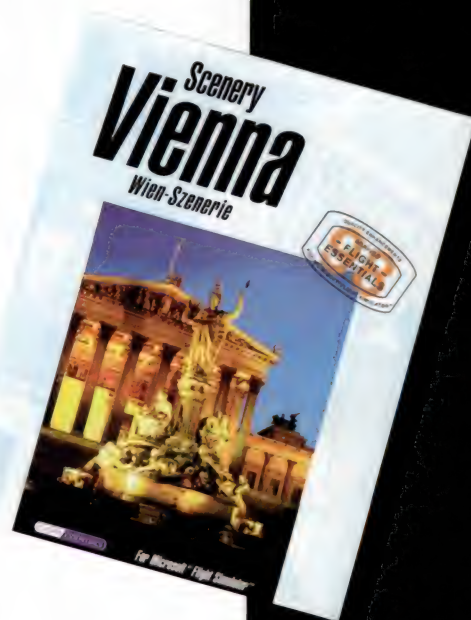
Review by Adam Howe

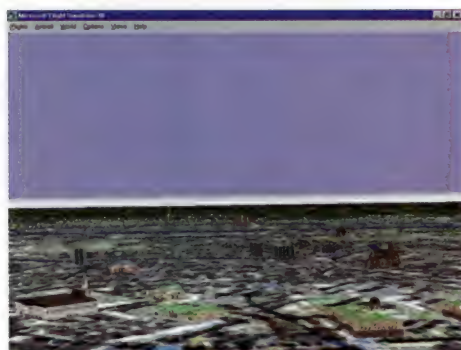
Welcome to Austria! (Well, a portion of Austria, anyway.) The **Scenery Vienna** package from LAGO helps flight simmers fly through the beautiful and historic landscapes of Vienna, Austria. Using detailed texturing, LAGO and The Flight Crew were able to create a great scenery package for every FS simmer. Installation on this package is extremely easy. Simply run the SETUP.EXE, select the path to FS and fly the scenery.

This scenery package covers over 7,500 square kilometers with 11 major airports, and is accurate to a detail of 10 meters per pixel. Visit over 20 major tourist attractions, which have been beautifully placed in Scenery Vienna. Most of these are very easy to find by selecting a pre-recorded flight from the **Flights | Select Flight** menu in FS.

I found this to be a great package on several levels. The detail stands out simply from reading the box! The complexity of the scenery becomes very apparent after loading the scenery in FS. The detail on the airports is very nicely done. Having dabbled in the arts of scenery design myself, I know how difficult creating detail can be. LAGO and The Flight Crew make it look effortless. You will find planes waiting on the tarmac near beautifully designed buildings and hangers at the airport, not to mention the buildings and tourist attractions scattered throughout the scenery. Another nice feature is the compatibility with Europe 1 scenery, by Apollo.

Flying Scenery Vienna in FS98, my Pentium 200 with 128MB of RAM reached a frame rate of 3.5-7 f/s, depending on the detail of the nearest scenery object. I am sure this would be enhanced with a good 3-D video card, as most scenery is. (I would add a 3-D video card to the list of system recommendations.)





The only criticism I have is that some of the outlying airstrips lack detail. I consider a runway in the middle of nowhere to be unrealistic (yes, I know it is a simulator). Overall, I found this package to be very good in the actual design and object details. This is a "must have" for any FS scenery library.

For More Information

Published by
The Flight Crew
Units A2/A3 Edison Rd.
St. Ives, Cambridge PE17 4LF
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Fax: +44 (0) 1494 511104
E-mail: mail@theassociates.co.uk
<http://www.flightsim.co.uk>

Developed by:
LAGO
P.O. Box 293
22100 Como
Italy
Fax: +39 31 300214
E-mail: 100411.3660@compuserve.com
Web: <http://www.lagoononline.com>

Europe 3 Scenery

Review by Scott M. Slaughter

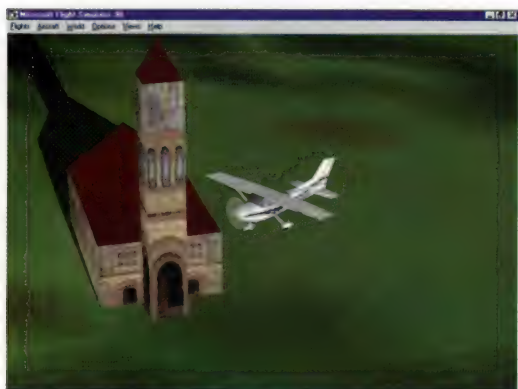
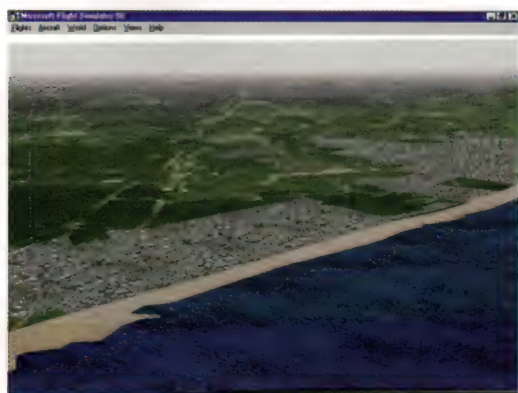
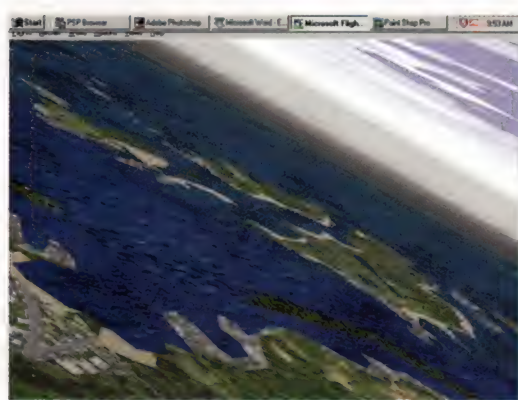
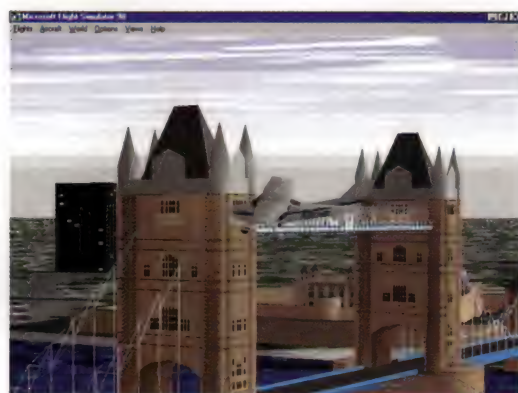
Several sceneries for U.K. (especially London) and western Europe have been released over the past few years, including many from Apollo Software. The latest addition to the popular European scenery series from Apollo is Europe 3. The scenery covers Great Britain below the 54th parallel. This area includes Wales, England, Channel Islands and the Isles of Scilly. The Channel Islands are actually a series of smaller islands (Jersey, Guernsey, Alderney, Sark and others) located near the French coast. The Isles of Scilly is located off the southwest tip of the U.K.

Europe 3 includes over 100 airports - including grass strips, buildings, approach lights and airport signs, rivers lakes, mountains and forests. You'll fly over and

around landmarks such as castles, factories and lighthouses. The package includes Jeppesen guides and airport charts showing the locations of airports, VORs and NDBs. The manual (in English, French and German) clearly explains the easy installation.

Europe 3 does a decent job of accurately covering a large area. The scenery is generally good but it's more for flying to landmarks than it is for sightseeing. For example, you'll only see a few buildings in downtown London, which leaves much room for more detail. The airports are, however, good. They're detail includes buildings, aprons, towers and hangers. The manual is good at explaining approach lighting, runway intersection signs, etc. You can even take off from a grass strip in at least one adventure.





Note that no aircraft are included with the package but flying the FS default Cessna works fine in most situations. I enjoyed flying along the famous white cliffs of Dover, finding the mysterious arrangement at Stonehenge, flying around the different islands and of course, flying through London.

If you're tired of flying or don't feel comfortable landing your aircraft, Europe 3 uses the FS LandMe feature at every airport. Simply press the [X] key and FS will land (we hope) your aircraft at the nearest airport. This is a nice feature to use to become more familiar with the airports and terrain.

The manual describes the easy installation procedure and suggestions for flights across the region. Europe 3's easy-to-use install program will place all the files in the correct location so you can begin using it immediately after starting FS. You won't need to enter the new scenery into the FS Scenery Library manually. Instead, the install program does this for you. After installation, you may access the scenery immediately

from the FS airport menu. The files in FS98 are in the "FS6 and Before" section of the World | Go To | Airport menu.

You'll also find data on each airport with navigation aids and maps showing the position of the nav aids and the airports.

Overall, this is a decent package. My suggestion is not to pay full retail price — always a good suggestion but especially true in this case. Look for it on sale or at a discounted price. Again, I enjoyed flying to the different areas. The manual is very good at explaining how to get there, which is a good feature for new FS simmers. Also the airport charts and Jeppesen guides are nice touches. Unfortunately, the program may not be compatible with the CoPilot program from Abacus.

For More Information

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www.apollosoftware.com

Omission

In the July/August issue we inadvertently omitted the website and E-mail address of author Sean "Crash" Reilly from his article **Virtual Airlines 101: A Crash Course**.

For more information, visit his website:

<http://www.flywestwind.com>

E-mail: sear.r@ix.netcom.com



Web Watch

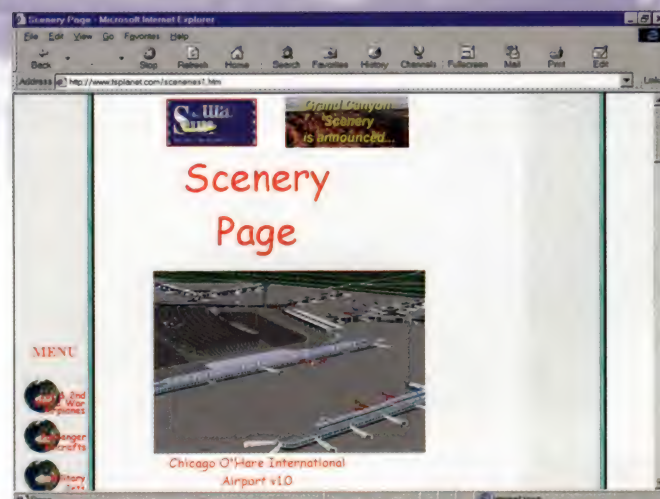
Internet Sites for Simmers

by Adam Howe

Our mach journey (pun intended) through the Internet today will bring us to some of the best downloads and information the Internet and the FS community have to offer. Grab your surf(key)boards, dudes, and let's hit the waves!

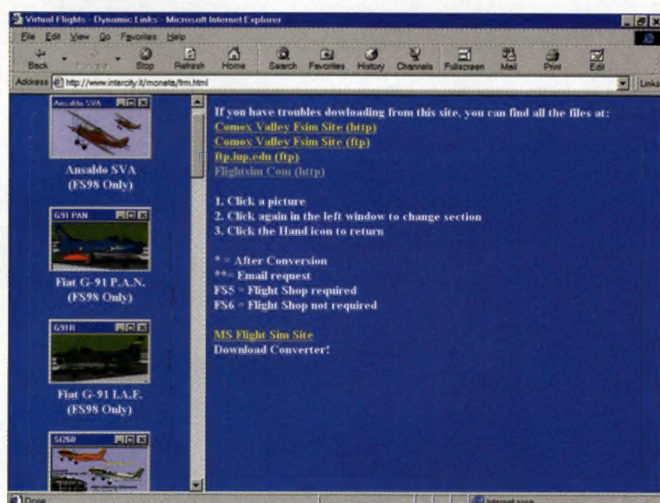
While logging on to the Internet, please secure all passwords and personal information in the overhead compartment as we begin our flight. Our tour today will give you the opportunity to add scenery, panels, aircraft and other features to your Flight Simulator.

Our first stop brings us to the FS Planet. By far, this is one of the best sites I have had the opportunity to review. The collection of aircraft, broken down by WWI and WWII, passenger, military and helicopters, is too extensive to count. The many pages with detailed images make choosing a favorite difficult, but looking for a specific plane is very easy. Other pages on this site include Sceneries, Tools, Panels, Gauges, Packages, Links, Chat page, About Me (the author of the site), Guest book, and more. There is even a spot for the kids with interesting vehicles for FS. Set your browser to: <http://www.fsplanet.com>.



As we begin journeying to our next site, please be sure all downloads are stored securely on your hard drive, and set your browser to <http://www.intercity.it/moneta/main.html>. Here you will find a good selection of downloads and nice graphics. (I especially like the animated GIF on the main page!) This site loads up quite fast and is a good place to visit often.





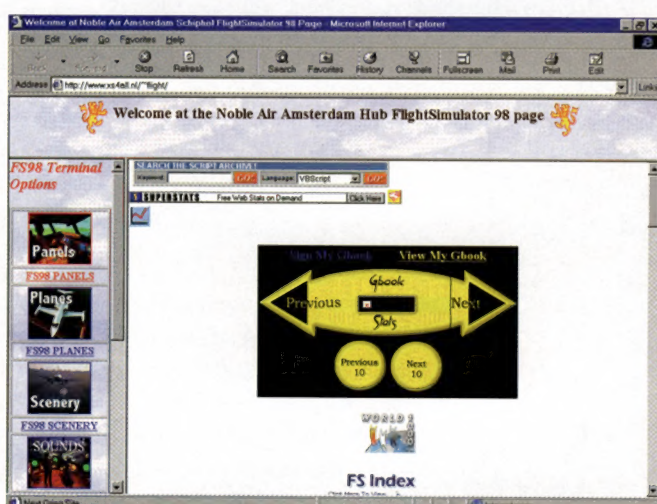
Our third stop on our voyage through the FS-infested waters of the Internet brings us to Rick's Fantastic Flight Sim Pages, at <http://www.ucl.ac.uk/~zcfand6/fs/index.htm>. This site is very helpful for beginners. It has a lot of information on how to get your files into FS properly, as well as a good selection of links. This is easily another "must visit" site.



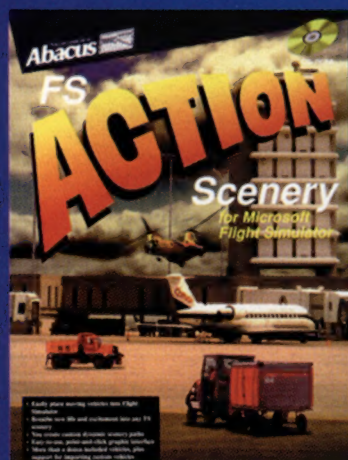
At stop number four, we find ourselves at a great page for general FS information, including Flight Plans, FS98 files, Videos, Pictures and the Flight Deck. For great information on upcoming and current products based on flight simulation, this is the place to be. By setting your browser to <http://www.users.globalnet.co.uk/~roc/index.html>, you will find all of this and more. For those Flight Simmers out there, you will find a great selection of heavies, as well as instrument panels for many types of aircraft.



Our final destination is <http://www.xs4all.nl/~flight/>. This is one of the best sites I have encountered for graphics and panels. You will also find an extensive collection of scenery, aircraft, tools, adventures and more. I would definitely add this site to your favorites. I especially like the graphics used on some of the pages—see if an image looks familiar to you on any of these pages (related to Full Throttle)!



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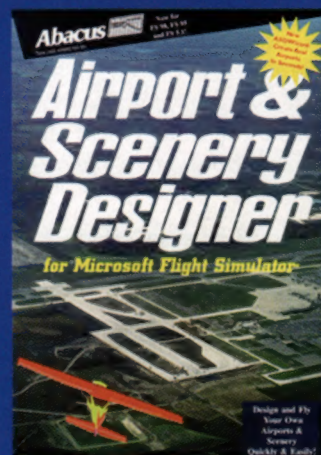
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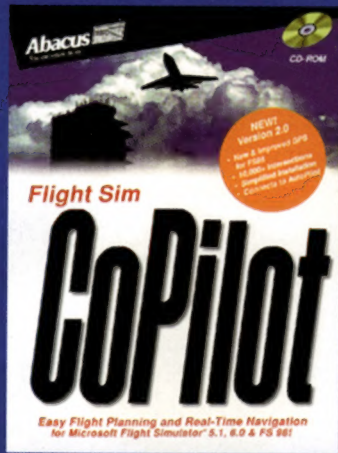
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Title: African Safari Scenery

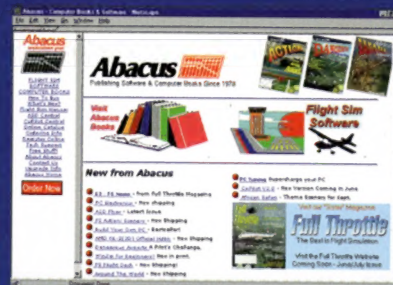
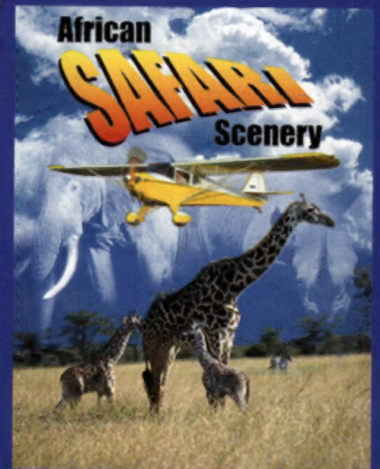
Item#: S352

UPC: 0-90869-55352-6

ISBN: 1-55755-352-1

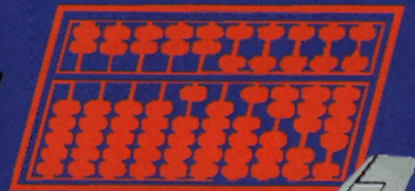
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Release: Available September 98



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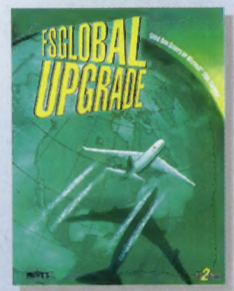
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